JOHN HEIL

appearance in reality

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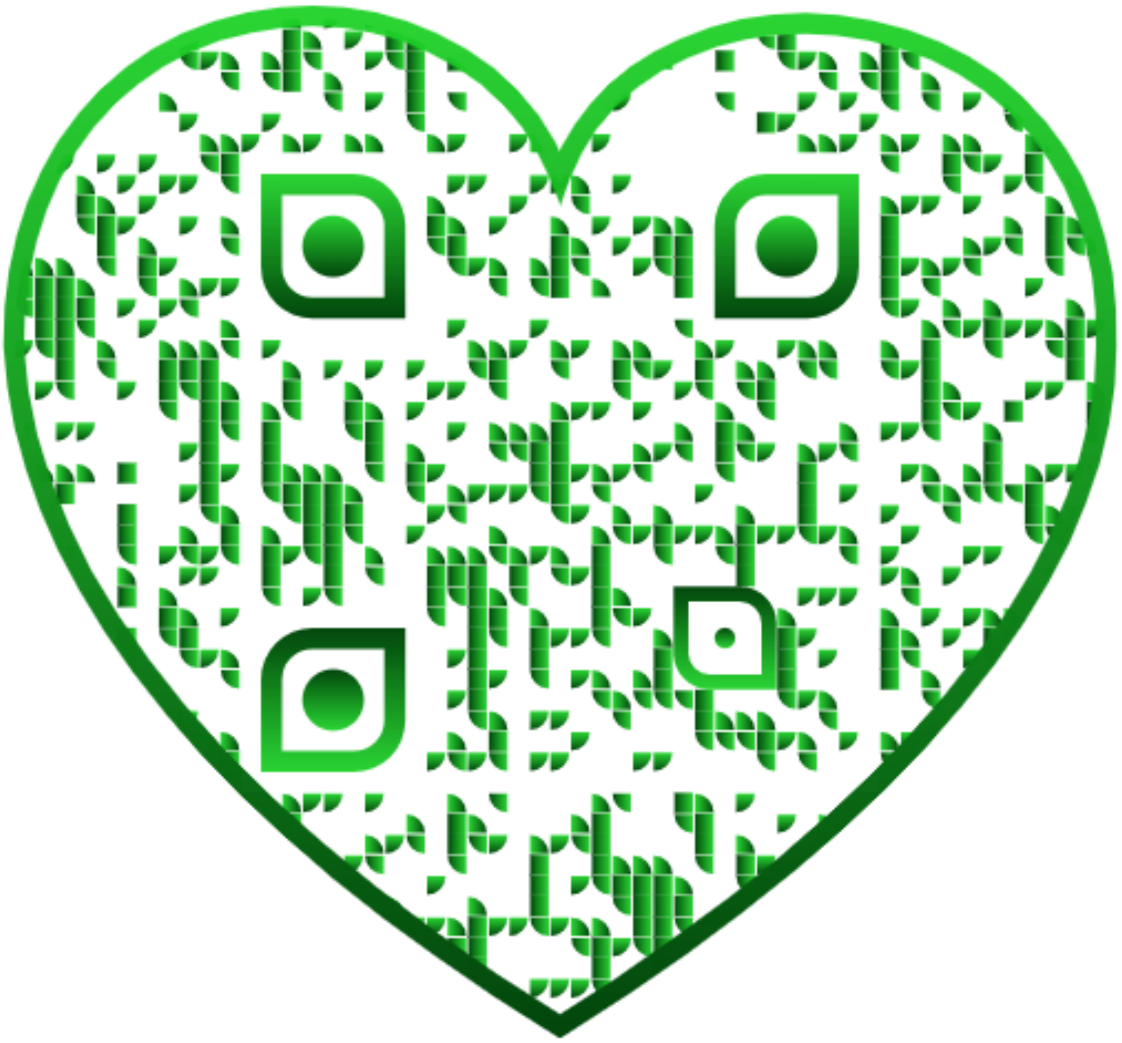

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For
Lucy Christine Ferguson Heil
Elizabeth Margaret Warner Smart
Lilian Harrison Hagan Heil

Preface

As many readers will be aware, the title of this book, *Appearance in Reality*, plays off F. H. Bradley's *Appearance and Reality* (Bradley 1893). Today, Bradley is remembered chiefly for his defense of idealism and his antipathy toward relations, but, as his title makes clear, he was stalking larger game: an account of the standing of the appearances and their bearing on reality. On the face of it, my approach to this topic differs profoundly from Bradley's. Still, when all is said and done, it could turn out that Bradley would have been better served had he used my title. All will be revealed in due course.

Meanwhile, I can tell you that the trajectory of this book retraces my own journey through philosophy. Years ago I was persuaded by C. B. Martin—Charlie Martin—to embrace a substance–property ontology, to take dispositionality seriously, and then, soon thereafter, to accept that objects' dispositionalities were rooted in their qualities. This led to a strong preference for an Aristotelian metaphysics of substances empowered by their qualities over various Humean competitors. Indeed many of the ideas defended in the pages that follow are expressions of my best efforts to combat what I had come to regard as a corrupting philosophical environment in which Humeanism was given a free pass.

In putting it this way, I am using 'Aristotelian' and 'Humean' to refer not to doctrines embraced by Aristotle and Hume, but in the currently fashionable sense that distinguishes conceptions of the universe according to which objects interact owing to their powerful natures from conceptions of the universe as lacking in genuine interactions. As David Lewis, a self-professed Humean puts it, all you have is 'just one little thing and then another'.

Although I remain convinced that Humeanism has been unduly influential, I eventually came to see that matters are not so straightforward. Are they ever? Although Aristotelianism provides a laudable conception of our comings and goings within the lived world, your perspective shifts once you embark on the project of reconciling what Wilfrid Sellars called the manifest and scientific images, the project of integrating appearance and reality. On reflection and trusting your ontological instincts, you come to see, or think you see, the universes of Spinoza and Hume converging and supplanting the Aristotelian alternative.

This dawned on me as a kind of revelation, the seeds of which were sown some years ago (circa 1979) when I attended a talk by Jonathan Bennett, 'Spinoza's Vacuum Argument', a version of which can be found in Bennett 1980. The seeds took root in the course of working through Keith Campbell's (1990) *Abstract Particulars* years later in a metaphysics seminar. As with revelations generally, this one has limited credibility. Perhaps, however, there is enough in it to inspire a sense of the underlying unities and interconnections among what might at first appear to be dramatically opposing worldviews. That, by my lights, is a stunning prospect.

John Heil

Melbourne, July 2020

Acknowledgments

Owing so much to so many people and institutions, I hardly know where to begin. The book would not have been possible without generous support during 2018–19 from the John Simon Guggenheim Memorial Foundation and from Washington University in St Louis, and, in 2020, from Fulbright Australia. Marie-Thérèse Jensen graciously allowed us to overstay our allotted time in Melbourne. A fellowship from the Institute of Advanced Study at Durham University during Epiphany term 2015 enabled me to participate in Durham's Emergence Project, and the generosity of Anna Marmodoro and the Templeton World Charity Foundation allowed me to spend Trinity term 2017 in Oxford.

The list of people to whom I am indebted in the course of developing my thoughts on the topics discussed here is enormous. Ten friends without whom I would be neither the person nor the philosopher I am are no longer in our midst: David Armstrong, Donald Davidson, Fred Dretske, J. J. Gibson, Jonathan Lowe, Charlie Martin, Norman Malcolm, Hugh Mellor, Mark Overvold, and Jack Smart.

Over the years, I have benefited, and continue to benefit from conversations with many others, including Jonathan Bennett, John Bigelow, Alex Carruth, Nancy Cartwright, Randolph Clarke, Javi Cumpa, Ozgur Demir, Heather Dyke, Anthony Fisher, Sophie Gibb, Robin Hendry, Valdi Ingthorsson, Frank Jackson, Jaegwon Kim, Peter Lewis, Fraser MacBride, Brian McLaughlin, Anna Marmodoro, Stephen Mumford, Graham Nerlich, Martin Pickup, Dave Robb, Gonzalo Rodriguez-Pereyra, Eleanor Rosch, Carlo Rovelli, Peter Simons, Roy Sorensen, Roger Squires, Galen Strawson, Eleonore Stump, Henry Taylor, Amie Thomasson, and Peter van Inwagen. Two anonymous readers for Oxford University Press provided detailed comments on the original manuscript thereby saving me from myself in many places.

I have learned much in discussions with postgraduate students—at Washington University in St Louis, at Durham University, and at Monash University including three of my current students, James Gulledge, Emily Prychitko, and Graham Renz, but also, and much earlier, with postgraduates at Cornell, Brown, Rochester, and Berkeley.

Dirk Baltzy, David Charles, and Christopher Shields endeavored to educate me on Aristotle. Michael Della Rocca, Yitzhak Melamed, and Martin Lin attempted the same with Descartes and Spinoza, as did Stewart Candlish on Bradley. Although I owe more than I can repay to Michael Esfeld, he will be disappointed to see that his efforts to make me see the light on relations have not born fruit. Elizabeth Miller provided advice on the material on quantum physics in Chapter 13. An anonymous American Airlines Media Relations representative kindly supplied the text of the announcements that appear at the outset of the book and in Chapter 14.

Finally, I am especially beholden to Keith Campbell, whose work remains an inspiration. I would like to think of this book as carrying on what Keith, and before him D. C. Williams, began. Whether they would approve of the result is another matter.

Undoubtedly, I have overlooked many friends and philosophers who ought to have been mentioned here. They will know who they are.

Earlier I acknowledged David Armstrong's role in making me who I am philosophically and otherwise. A rereading of Armstrong's *A Materialist Theory of the Mind* (1968) on the occasion of the fiftieth anniversary of its publication, helped me to appreciate that it is both possible and desirable to produce serious philosophical work without relying on footnotes. Philosophers, myself included, have grown stylistically lazy, allocating material to footnotes that is either inessential or properly belongs in the body of the work. The practice, like so many social interactions today, betrays a lack of interest in the welfare of others, in this case our readers. In an attempt to make amends, I have allowed myself no footnotes in the pages that follow.

Epigraphs featuring D. C. Williams appearing in Chapters 1, 2, 3, 4, and 12 are used by permission of Charles C. Thomas Publisher Ltd (thanks to the diligence of Sharon Moorman). The epigraph in Chapter 6 appears with the permission of Taylor & Francis Group, the epigraph in Chapter 8 is used with permission of Springer Nature BV through PLSclear, and the epigraph in Chapter 9 is used by permission of *Journal of Philosophy*.

Most of the material used here was originally produced for lectures, workshops, and conferences during the course of which it was improved in countless ways by discussions with attendees and participants. Some of these presentations were subsequently published before being rewritten, in most cases extensively, for this volume. I am grateful to editors and publishers for permission to use what I have used and especially grateful to Elissa Connor whose editorial acumen improved the book in countless ways and to OUP's stalwart philosophy editor, Peter Momtchiloff, for supporting the project.

Chapters 1 and 3 have their origins in Heil 2018b, a paper delivered as the inaugural E. J. Lowe Lecture, March 11, 2015, at Durham University. The paper is dedicated to Jonathan's memory. Subsequent versions were presented at the Mid-Atlantic Philosophy of Language Workshop, University of West Virginia, August 6, 2015, and at a conference, 'Metaphysical Questions', convened at Lake Garda, Italy, October 29–31, 2015.

Chapter 2 makes use of material in Heil forthcoming-b which began life as a paper presented as 'Category Mistakes' at a conference, 'What Are Categories? From Universality to Mentality', at the University of Madrid, May 24, 2017; at a conference honoring Peter Simons Trinity College Dublin, May 18, 2017; and at Durham University, May 4, 2017.

Chapter 5 incorporates portions of Heil 2019, which was originally written for a conference, 'Ontological Commitments of Dispositionalism', University of Innsbruck, August 2, 2013. Roy Sorensen called my attention to the Tolstoy quotation that appears as an epigraph.

Chapter 6 includes material in Heil 2018c, which originated as a lecture, 'The Mystery of the Mystery of Consciousness', at St Paul's School, London, November 3, 2014. Subsequent iterations of the paper were delivered at a workshop, 'Metaphysics of Consciousness', Durham University, March 26, 2015; at Fort Lewis College, Durango, CO, April 13, 2015; and at the 'Toward a Science of Consciousness' conference, Helsinki, June 11, 2015. Versions of the paper resurfaced as 'Qualities Unleashed', at a conference, 'Powers, Qualities, and the Metaphysics of Mind', August 9, 2017, at Durham University; and at Monash University, August 1, 2018.

Chapter 7 leans on Heil 2016, 'Causal Relations', a presentation at a conference, 'Metaphysics of Relations', Institute of Philosophy, University of London, October 5, 2012, ancestors of which were presented at Monash University, March 11, 2013; and at the Serious Metaphysics Group, Cambridge University, February 5, 2015. The chapter includes, in addition, material from two unpublished papers, 'Causal Production', presented at a conference, 'Causation in Science: Powers, Mechanism, Singularism', Norwegian University of Life Sciences, Ås, Norway, September 15, 2014; and 'Manifestations', delivered at a conference, 'Dispositions and their Manifestations', at the University of Cologne, August 22, 2015.

Chapter 8 extends Heil 2017a, which was originally presented at a conference, 'Emergence and Causation', at Università degli Studi di Macerata, Macerata, Italy, September 24, 2015.

Chapter 9 is the upshot of Heil forthcoming-a, which began life as 'Hylomorphism: What's Not to Like?', a paper delivered at a conference,

'Neo-Aristotelianism', held at the Palmer House in Chicago, October 1, 2016. Subsequent versions were presented at the University of Tasmania, February 24, 2017, and at Corpus Christi College, Oxford, June 1, 2017. The paper evolved significantly as a result of perceptive comments from members of the audience on those occasions, especially David Charles, Anna Marmodoro, Anna Schriefl, and Christopher Shields.

Chapter 10 is a variant of Heil 2015a, 'Aristotelian Supervenience', an Aristotelian Society lecture delivered on November 3, 2014 at the University of London. The paper stemmed from discussions with participants in an NEH Summer Seminar, 'Metaphysics and Mind', convened in 2013 at Washington University in St Louis. I am particularly grateful to Elizabeth Miller for perceptive comments on an earlier draft. My discussion of D. C. Williams in the chapter owes much to Anthony Fisher and I am grateful to Daniel Nolan for help with David Lewis.

Chapter 11 extends Heil 2018a.

Chapters 12 and 13 make use of material in Heil forthcoming-c, which was originally presented under the title 'The Lowest and Grubbiest Inquiry' at Nottingham University, March 11, 2016; as the Henry and Augusta Sievert Lecture at the University of Iowa, April 8, 2016; and at a conference, 'Fundamental Truthmakers: A Metaphysics Festival', University of Miami, April 22, 2016. Versions of the paper put in appearances at other venues, including 'Whither Efficient Causation?', at a conference on 'Powers, Dispositions, and the New Essentialism', American University of Beirut, Beirut, Lebanon, April 29, 2016; 'Efficient Causation Under Threat', at the 5th Annual Midwest Workshop in Metaphysics, University of Nebraska, October 15, 2016; and 'Efficient Causation: What's Not to Like?', Yale University, September 15, 2017.

Chapter 14 is based on Heil 2017b, versions of which were presented at the University of Nebraska Omaha, January 30, 2014; at a conference, 'Powers, Perception and Agency', British School of Rome, September 27–28, 2014; at a Durham Emergence Project conference, 'Powers and Human Agency', Durham University, March 16, 2015; at the College of the Holy Cross, Worchester, MA, April 17, 2015; at the 'Fordham-Rutgers Metaphysics of Mind Conference', New York City, February 14, 2016; at a conference, 'Free Will and Moral Responsibility', St Louis University, February 11, 2016; at Monash University, March 3, 2017; and at University of Illinois Urbana–Champaign, March 31, 2017. A version, 'Free Will and Physics', served as the Fritz Marti Lecture, Southern Illinois University Edwardsville, March 24, 2017. The paper benefited from criticisms and advice offered on those occasions and especially from comments provided by Randolph Clarke and Harrison Hagan Heil.

Contents

1. Metaphysics 1
   - 1.0 What Is Metaphysics? 1
   - 1.1 The Inevitability of Metaphysics 3
   - 1.2 The Manifest and Scientific Images 4
   - 1.3 Reality as Hierarchical 7
   - 1.4 The Three Options 9
   - 1.5 A Package Deal 10
   - 1.6 Truthmaking 12
   - 1.7 Aristotelianism and Humeanism 12
   - 1.8 What You Can Expect 13

2. Ontological Categories 17
   - 2.0 Analytic Ontology 17
   - 2.1 Truthmaking and Foundedness 20
   - 2.2 Other Categories 23
   - 2.3 Spatial, Temporal, and Causal Relations 25
   - 2.4 Universals 28
   - 2.5 Attributes 29
   - 2.6 *Abstracta* 31
   - 2.7 Modality 32
   - 2.8 Inconclusive Reasons 36

3. Substance and Property 37
   - 3.0 Ontology and Cosmology 37
   - 3.1 Ordinary Objects 38
   - 3.2 Propertied Substances 39
   - 3.3 The Priority of Substance 41
   - 3.4 Substantial and Non-Substantial Parts 42
   - 3.5 Substantial Simplicity 43
   - 3.6 Substances as Property Bearers 46
   - 3.7 Complex Objects 47
   - 3.8 Vagueness 49
   - 3.9 Coinciding Objects 53
   - 3.10 Properties and Powers 55
   - 3.11 Properties of Complex Objects 57
   - 3.12 Objects as Modes 59

4. Essences, Kinds, Universals 61
4.0 Old Dog, New Trick 61
4.1 A Corpuscular Universe 62
4.2 The Essential Lowe 63
4.3 Thinking Comprehendingly 64
4.4 It Is Never Easy 66
4.5 Essences and Universals 68
4.6 Slippage 70
4.7 Layers of Confusion 71
4.8 From Many to One 73
4.9 Engaging with the Universe 75
4.10 Dénouement 76

5. Qualities and Powers 78
5.0 Qualities 78
5.1 From Language to Ontology 80
5.2 Powerful Substances 82
5.3 Powers as Relations 84
5.4 Real Powers 85
5.5 Powers as 'Higher-Order' Properties 87
5.6 Empowering Qualities 91

6. Qualities Unbound 93
6.0 Autobiographical Interlude 93
6.1 The Puzzle 94
6.2 Making a Hard Problem Impossible 96
6.3 Primary and Secondary Qualities 98
6.4 Qualities and Powers 100
6.5 Experiential Qualities 103
6.6 Bodily Sensations 105
6.7 Undergoing vs Observing an Undergoing 107
6.8 The View from Somewhere 109

7. Causation 111
7.0 Prologue 111
7.1 Causal Production 111
7.2 Causation and Laws 113
7.3 External Relations, *Auf Wiedersehen* 117
7.4 A Power-Imbued Universe 120
7.5 Necessity and Contingency 123
7.6 Historical Interlude 124
7.7 Laws, Powers, Causation 126
7.8 Absent Causes 128

8. Emergence and Downward Causation 130
8.0 Wholes 130
8.1 Species of Downward Causation 133
8.2 Emergence 134
8.3 Properties 137
8.4 Wholes without Parts 141
8.5 Campbell's Panpsychism 142
8.6 Efficient Causation 145
8.7 Real Emergence 146

9. Hylomorphism 148
9.0 Learning from Our Betters 148
9.1 Hylomorphisms 149
9.2 Aristotle 151
9.3 Matter 154
9.4 Form 155
9.5 The Blancmange Universe 158

10. The Art of the Possible 162
10.0 Modal Truths 162
10.1 Alternative Universes 163
10.2 Humean Supervenience 165
10.3 Modal Realism 168
10.4 Contingency 171
10.5 Aristotelian Modal Realism 174
10.6 Aristotelian Modal Discourse 177

11. Brute Fact 179
11.0 What Would Make a Fact Brute? 179
11.1 From Facts to Ways 181
11.2 From Laws to Powers 183
11.3 Reality's Constraints 184
11.4 Whither Humeanism? 186

12. Roots of Things 189
12.0 Stirring the Pot 189
12.1 Layered Ontologies 190
12.2 Speculative Cosmology 191
12.3 Speculative Speculative Cosmology 193
12.4 Change and Its Basis 196
12.5 Efficient Causation 198

13. Reconciliation 203
13.0 Quantum Ontology 203
13.1 'Where's the Beef?' 205
13.2 Priority Monism 207
13.3 Hume, Spinoza, and Quantum Physics 210

13.4 Unifying the Manifest and Scientific Images 211
13.5 Appearance in Reality 214
13.6 Coda 215

14. Agency 217
14.0 The Antinomy of Agency 217
14.1 The Necessitarian Foil 219
14.2 Making Room for Agency 220
14.3 The Shadow of Physics 222
14.4 The Levels Option 224
14.5 Three Approaches to Agency 226
14.6 Trees, Baseballs, and Agents 227
14.7 Seeds of Agency 231
14.8 Compatibilism? 233

Epilogue 236
The Point of It All 236
Appearance and Reality 237
Go Well 239

References 241
Name Index 249
Subject Index 251

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1
Metaphysics

> Metaphysics is the most scientific of the sciences because it tries the hardest to explain every kind of fact by one simple principle or simple set of principles. It is the most empirical of sciences because, by the same token, a metaphysics is directly relevant to and confirmable or falsifiable by every item of every experience, whereas every other science is explicitly concerned with only a few select and abstract aspects of some experiences.
>
> D. C. Williams 1944: 431; 1966: 227

1.0 What Is Metaphysics?

Although metaphysics has been on the scene since the dawn of philosophical inquiry, informative characterizations of what metaphysics is remain elusive. This is not because metaphysics is a vague or shapeless endeavor. The difficulty is perfectly general. You can see what I mean by attempting an informative characterization—a characterization that would reveal the nature of a subject matter to someone not already familiar with it—of the calculus, or analytical chemistry, or poetry.

You learn what these things are by taking them up, engaging with them, and thereby acquiring a sense of what they are about. So it is with metaphysics. I could tell you that metaphysics attempts to limn the nature of being or that it seeks a completely general description of reality, but, even if apt, such characterizations are little more than conversation-killers.

Most readers with the courage to pick up this book will already have some sense of what metaphysics encompasses and may perhaps be favorably disposed toward the subject. Other readers will be skeptics. Still other readers will simply be curious as to what metaphysics could possibly have to offer that is not already covered by the sciences, the arts, or religion.

To the skeptics, I have little to say in this chapter that would allay their concerns. For readers unfamiliar with metaphysics, the ensuing chapters are

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designed to put metaphysics to work in a way that exemplifies its potential for illumination.

Although much of the material I will be discussing is aimed at philosophers already working on topics in metaphysics, I have put a premium on clarity and simplicity and tried to avoid gratuitous technicalities. Too often we philosophers disguise the insignificance of our thoughts by cloaking them in jargon and formalisms that subsequently take on a life of their own and become ends in themselves. Metaphysics is not easy, but it is not hard in the way quantum physics or bioinformatics are, for some of us anyway, hard. The pursuit of metaphysics requires a visceral feeling for the subject. Bloodless technicalities are largely distractions.

The downside of being clear is that you risk being understood. Philosophy is an inherently risky endeavor. My ambition is to convince you that metaphysics, far from being an effete pastime of interest only to a minority of specialists with PhDs, is an inevitable product of our engagement with the universe. I begin setting the stage in the next section by posing the question, how are the appearances related to reality? By the appearances, I have in mind not simply the way things unreflectively strike us, but our considered impressions of how things stand that guide us in everyday life and in our pursuit of the various sciences.

In succeeding chapters I turn to metaphysics proper. I have sought to make chapters self-standing to the extent that this is possible without undue repetition. The relation of appearance to reality provides a unifying theme, one that I believe runs as a continuous thread through the fabric of philosophy. The account I offer is not new. What changes over time is not the account, but the audience for it and, accordingly, its mode of presentation.

Before settling in, a word is in order concerning 'metametaphysics', a topic much discussed by academic philosophers in recent years. Metaphysics abstracts from concrete features of the universe, thereby running the risk of floating free of the usual external constraints on serious inquiry. Metametaphysics abstracts from the abstractions and so, as Byron observed 200 years ago, is doubly at risk.

> And Coleridge, too, has lately taken wing,
> But like a hawk encumber'd with his hood,
> Explaining Metaphysics to the nation—
> I wish he would explain his Explanation.
>
> (George Gordon Lord Byron, *Don Juan*)

Even if metametaphysics were a useful and productive enterprise, however, it would be unrevealing to anyone not already acquainted with the subject. Under the circumstances, the only option is to dive in and let metaphysics speak for itself.

1.1 The Inevitability of Metaphysics

You can begin to get a feel for the inevitability of metaphysics by considering the aforementioned problem of the relation appearance bears to reality. This is a problem that confronts each of us as soon as we begin reflecting on ourselves, on others like us, and on the universe as we find it. We start with the appearances and turn to the sciences to reveal the nature of what appears. As it happens, the nature of things as revealed by the sciences is often at odds—in some cases, deeply so—with ways they present themselves to us in lived experience.

To appreciate the difficulty, it is not necessary to invoke quantum physics or general relativity. Think of the colorful appearances of familiar objects, tomatoes, for instance. Ripe tomatoes are red. Who, outside the philosophy seminar room, would doubt it? But physics and chemistry tell us that tomatoes are made up of colorless particles. How could colorless somethings add up to something colored?

Perhaps a tomato's red appearance is not in the tomato. In that case, where is it? Where do you locate colors in a colorless universe?

One family of answers to this question situates colors in the minds of observers. Philosophers speak of 'phenomenal redness', distinguishing this from features of the tomato that produce colorful experiences in observers. Colors—or 'phenomenal colors'—are in this way excised from the universe as encompassed by the physical sciences.

This is all well and good for the physical sciences, but it saddles any moderately reflective agent with a location problem. If experienced colors reside, not in the material universe, but in the minds of observers, this would seem to locate minds outside the physical realm. More generally, if appearances of things are distinguished from the things, the result is a bifurcated universe comprising, on the one hand, minds and their contents, and, on the other hand, physical reality.

Although this kind of dualism enjoys a measure of respectability in the philosophical community (always a low bar), you might regard it as hopelessly naive. Psychology and neuroscience encourage the thought that old-fashioned

appeals to nonphysical minds should be replaced by talk of brains, or maybe neural mechanisms, or networks, or neurological software. The idea that minds subsist apart from brains belongs, it would seem, to a bygone era in which spirits were invoked to explain disease and the weather.

These comforting thoughts fail to address the original problem, however. How can you locate the appearances of things within a universe the scientific description of which systematically excludes them? Consigning appearances to minds, and then identifying minds with brains looks hopeless. If a tomato's redness is separated from the tomato because the tomato is made up of colorless particles, how could redness reside in the brains of observers when brains are themselves made up of colorless particles?

These questions will be addressed head-on in subsequent chapters. For the moment, I mean only to illustrate one way in which philosophy, and in particular metaphysics, forces itself on us. If we are honest, we will admit the questions' legitimacy, even if we then leave it to others to provide answers. To brush them aside as 'merely philosophical' is to betray a lack of candor unbecoming reflective agents.

1.2 The Manifest and Scientific Images

Perhaps I have said enough to convince you that metaphysical reflection might not after all be a wholly pointless philosophical exercise aimed at establishing by means of tedious arguments either something incredible or something everyone already knows. The question of how appearance is related to reality becomes pressing the moment you accept that you are not a detached spectator on the universe, but very much *in* the universe.

I have sought to bring you on board by asking you to consider a troubling disparity between characteristics of experienced objects on the one hand and, on the other hand, characteristics we take those objects to have when we regard them as a physicist might. The disparity I have in mind, however, has a much broader scope. The point was made salient more than a half century ago by Wilfred Sellars in the course of distinguishing what Sellars called the manifest and scientific images.

> The philosopher is confronted not by one complex many-dimensional picture, the unity of which, such as it is, he must come to appreciate; but by *two* pictures of essentially the same order of complexity, each of which purports to be a complete picture of man-in-the-world, and which, after

> separate scrutiny, he must fuse into one vision. Let me refer to these two perspectives, respectively, as the *manifest* and the *scientific* images of man-in-the-world. (Sellars 1963: 5)

Sellars is echoing physicist A. S. Eddington, who had, three decades earlier, set out to write his 1927 Gifford Lectures by drawing up, as he put it, 'my chairs to my two tables'.

> Two tables! Yes; there are duplicates of every object about me—two tables, two chairs, two pens.
>
> One of them has been familiar to me from earliest years. It is a commonplace object of that environment which I call the world. How shall I describe it? It has extension; it is comparatively permanent; it is coloured; above all it is substantial.
>
> Table No. 2 is my scientific table. It is a more recent acquaintance and I do not feel so familiar with it. It does not belong to the world previously mentioned—that world which spontaneously appears around me when I open my eyes, though how much of it is objective and how much subjective I do not here consider. It is part of a world which in more devious ways has forced itself on my attention. My scientific table is mostly emptiness. Sparsely scattered in that emptiness are numerous electric charges rushing about with great speed; but their combined bulk amounts to less than a billionth of the bulk of the table itself. (Eddington 1928: ix–x)

Eddington's first table is an unexceptionable fixture of Sellars' manifest image, the picture of the universe that guides everyday interactions with our surroundings, including the interactions of scientists wielding instruments in their laboratories. The second table belongs to the image of the universe issuing from those laboratories. The difficulty, remarked by both Eddington and Sellers, is to understand how the two tables, the two images, are related.

One possibility is that the manifest image is an illusion, a serviceable fiction perhaps, but at bottom a *mere* appearance; only the scientific image is credible. As Eddington puts it: 'modern physics has by delicate test and remorseless logic assured me that my second scientific table is the only one which is really there' (1928: xxi).

Another, rather less respectable, possibility is that the scientific image affords only an instrumentally useful framework for negotiating reality as revealed by the manifest image, not something to be taken literally.

A third possibility—suggested by the quoted passage, but not in fact embraced by Eddington—is that reality is hierarchical: the scientific image depicts a kind of ground-floor reality, while the manifest image is peopled by 'higher-level' items grounded in successively more fundamental levels. Eddington's 'familiar' Table No. 1 is not reducible to his 'scientific' Table No. 2. Both are real. The reality of Table No. 1 is somewhat attenuated, however. Table No. 1 is asymmetrically dependent on Table No. 2. Table No. 1 'supervenes' on, or is 'realized by', Table No. 2. Table No. 1, the everyday table, is, in this regard, real but 'less fundamental' than Table No. 2, the scientific table.

I hope to persuade you to consider a fourth option: the scientific image, the picture of the universe we extract from physics, constitutes our best guess as to what could be called the deep story about what the manifest image is an image *of*, the nature of occupants of the manifest image.

This might be what Eddington has in mind when he asks rhetorically: 'You speak paradoxically of two worlds. Are they not really two aspects or two interpretations of one and the same world?' His answer: 'Yes, no doubt they are ultimately to be identified after some fashion. But the process by which the external world of physics is transformed into a world of familiar acquaintance in human consciousness is outside the scope of physics' (1928: xiv).

The idea, roughly, is that when you point to a table, what you point to could be exhaustively characterized in fundamental physical terms. This way of putting it is potentially misleading in at least two respects, however.

First, in speaking of fundamental physics I am not thinking of physics as providing an account of a special category of fundamental things, everything else being in some regard less fundamental. I am thinking rather of the kind of physics bent on characterizing whatever ultimately makes up what there is, fundamental physics as distinguished from astrophysics or solid state physics, for instance.

Second, in speaking of what can be characterized in fundamental physical terms I mean only to speak of the subject matter of fundamental physics, not something in any way dependent on the language used to characterize it. Nor am I suggesting that truths about ordinary objects—tomatoes, tables—are analyzable into, replaceable by, or derivable from truths expressed in the vocabulary deployed by physicists.

I consider this conception of the relation between the manifest and scientific images to be unremarkable, although it is currently out of favor among philosophers. You can find philosophers who embrace the first conception mentioned above, regarding the manifest image as perpetuating a kind of illusion. And you can find philosophers (including physicists wearing their

philosophical hats) who take the opposite view, regarding physics as instrumentally valuable, but not as providing a vehicle for literal truths. Each of these conceptions seems, in its own way, implausible. Only a philosopher could imagine that tables and tomatoes are unreal or illusory or any less real than electrons and fields. And only a philosopher would stoop to regarding physics as nothing more than an instrument useful in negotiating the appearances.

Philosophers are not the only philosophers. If, as I contend, metaphysics is inescapable, there will be pressure on any tolerably serious thinker to reflect from time to time on metaphysical issues. Here, the chief advantage of being a philosopher is its affording you the opportunity to engage self-consciously in such reflections. It goes without saying that training in philosophy brings with it no guarantee of success. What philosophical training can do is make you aware of options and the extent to which they are genuinely optional.

1.3 Reality as Hierarchical

What of the third conception of the relation between the manifest and scientific images? Both images are veridical, both can correctly describe aspects of the universe, but they do so by describing distinct 'orders' or 'levels' of reality. Higher-level features of the universe are dependent on, but not reducible to, lower-level features.

A conception of this kind typically posits a hierarchy of levels, each dependent on, without being reducible to, the next lower level. The psychological level could be taken to depend on, without being reducible to, the biological level, which in turn depends on, without being reducible to, the biochemical level, which itself depends on the level of fundamental physics without being reducible to physics.

The original motivation for a hierarchical conception of this kind was the failure of reductionist programs in the philosophy of science, where these amounted to attempts to derive higher-level truths from those at lower levels—to derive distinctively psychological or biological truths from truths expressed in the vocabulary of fundamental physics, for instance.

From the thought that you cannot extract truths about tables or tomatoes from truths about quarks and leptons, however, it does not follow that every table and every tomato is not, at bottom, an organized, interactive collection of quarks and leptons that is as it is and is capable of doing what it does owing to the nature of, and interactions among, its constituent quarks and leptons. Not

only does this not follow, denying it and accepting a hierarchical conception of the universe leads to embarrassing questions about relations among levels.

Suppose that tables and tomatoes are higher-level items, dependent on but in some manner distinct from entities posited by physics, quarks and leptons, maybe, or fields. Tables and tomatoes evidently have properties not possessed by quarks and leptons, or fields. A table might be rectangular and white, a tomato red and spherical, but particles and fields are not rectangular, or white, or red, or spherical.

Could these properties be just what you get when you put together vast numbers of quarks and leptons or configure a field in the right way? That seems right. We know that were a table or tomato dismantled, it would turn out to be made up of the very things that make up everything else, whatever these might ultimately prove to be. The trouble is, it appears impossible to derive or anticipate truths about tables and tomatoes and their various properties from truths of physics: we confront an 'explanatory gap' between physics and occupants of the manifest image.

Perhaps tables, tomatoes, and their properties 'arise' or 'emerge' from particle configurations or fields. Whatever the story, it appears that there is much more to tables and tomatoes than what you have in physics. In coming to grips with how tables and tomatoes affect and are affected by their surroundings, we are obliged to appeal to their distinctive properties.

The tomato rolls across the tabletop because the tomato is spherical and firm and the tabletop is flat and solid. We are adept at predicting the behavior of everyday objects by invoking principles that have no counterparts in physics. Spherical things roll, wooden surfaces are solid. Sphericality and solidity seem to contribute to objects' capacities or powers. But how could they? Physics tells us that the particles or fields are governed by laws. These laws might be strictly deterministic or they might be statistical in character. But whatever their nature, the laws fully explain the behavior of whatever they govern. If that is so, however, how could properties of tables and tomatoes contribute to the behavior of tables and tomatoes?

Philosophers call this the problem of 'causal relevance'. We are happy to explain and predict the behavior of higher-level things by reference to their properties. But if the higher-level things—the tables and tomatoes—are dependent on, perhaps because they are made up of, lower-level things, characteristics of these lower-level things would seem to undercut or preempt any causal contribution properties of the higher-level things might be thought to make. The behavior of the lower-level things is governed by their own distinctive laws.

Return to the thought that the tomato and table are made up of particles. If the tomato rolls across the table's surface, particles would move in definite ways. These ways reflect laws governing particle motions and interactions, and these would seem to have nothing to do with familiar properties of tables and tomatoes. Properties of higher-level things, indeed the things themselves, would appear to be epiphenomenal.

Is this just another hokey philosophical problem, a case of philosophers' mystery mongering? Well, consider: do you accept that tables, tomatoes, along with other occupants of Sellars' manifest image, are real? Do you accept that tables and tomatoes are not illusions? If you do, what relation do you think they bear to the quarks, leptons, and fields? Perhaps tables and tomatoes are nothing 'over and above', nothing 'in addition to', 'nothing but' configurations of quarks, leptons, fields. Perhaps tables and tomatoes are nothing more than configurations of quarks and leptons.

This amounts to the idea that the manifest image is reducible to the scientific image. Reduction, however, 'nothing but-ism', appears to be a nonstarter. If you confine yourself to physics, you lose information. Imagine deciding how to bake a cake, or throw a changeup, or lower unemployment, or set a broken limb, or, for that matter, to explain the nature and evolution of organisms, while confining yourself to physics. It looks as though the manifest image encompasses an endless array of objects, possessing properties, standing in myriad relations, and interacting in all sorts of ways that utterly elude physics. Unless you want to say that these things are illusory or *mere* appearances, a palpably desperate move, it would seem we need to find a place for them in the universe.

Given that reduction is not an option and that relegating the manifest image to the status of an illusion is equally unattractive, what else is there but the idea that reality comprises a hierarchy of levels? On the ground floor you have whatever physics tells us there is. But this is not all there is. Relations among levels remain to be spelled out, perhaps, but those are metaphysical details concerning which there is no shortage of theories. In philosophy there is rarely a shortage of theories, only a lack of consensus.

1.4 The Three Options

Notice that, whether you are sympathetic to the idea that reality comprises a hierarchy of levels, or you think the idea is ridiculous, you are, like it or not, engaged in metaphysical reflection and pulled in one direction or another.

Returning to Sellars' manifest and scientific images and Eddington's two tables, we seem compelled to choose from among three expressly metaphysical options:

(1) The manifest image is mere appearance, reality is as the scientific image says it is. (Table No. 1, the everyday table, is an illusion, only the scientific table, Table No. 2, is real.)
(2) The manifest image is non-negotiable, the scientific image is instrumentally useful, but not meant to be literally true. (Table No. 2, the scientific table, is a 'construct', something invented to enable us to find our way around in a universe comprising familiar everyday objects including Table No. 1.)
(3) The manifest image describes higher-level, less-than-fundamental realities rooted in a fundamental, or relatively fundamental, reality addressed by the scientific image. (The scientific table is a fundamental constituent of the universe, everyday tables are higher-level entities, dependent on, but reducible to, the fundamental things.)

In the pages that follow I shall be offering reasons to think that each of these options is flawed and that another, more appealing option is available, an option hinted at earlier. For the time being I am purposely omitting mention of an alternative advanced by F. H. Bradley in *Appearance and Reality* (1893), a book this one is meant to call to mind, reserving discussion of Bradley for Chapter 14. Meanwhile, I propose to introduce a number of themes that will play out in the intervening chapters.

1.5 A Package Deal

One difficulty peculiar to metaphysics is worth mentioning before taking the plunge. Metaphysics, as I conceive it, is not something that could be pursued piecemeal. The common practice of embracing one or another metaphysical thesis because doing so enables the embracer to solve one or another philosophical problem, is what gives the enterprise a bad name. Metaphysics is what my philosophical godfather, C. B. Martin, liked to call a package deal. A metaphysical thesis earns its keep in concert with ordinary experience, with the sciences, and, inevitably, in concert with other metaphysical theses.

In setting out to write a book concerned with topics in metaphysics, it is hard to know where to begin. An idea introduced and explained in one place owes its plausibility in part to ideas not yet introduced and explained. The temptation is constantly to reorganize, to rearrange, and to want to blurt everything out at once. Under the circumstances, I shall have to enlist the support of you, the reader, asking your patience with my necessarily linear presentation of a manifestly nonlinear subject.

I have made an effort to mitigate potential sources of confusion or concern by foreshadowing material to be addressed later and by inserting reminders of points made earlier. One beneficial side effect of this way of proceeding is that chapters are more accessible individually than they might have been otherwise. To be sure, accessibility is a relative matter when it comes to philosophy. I have, at least, avoided formalisms and, wherever feasible, proprietary terminology. The enterprise will have been successful if its faults as well as its virtues are patent.

Speaking of terminology, philosophically attuned readers might find puzzling my preference for 'universe' over 'world'. The preference stems from a distaste for metaphysical discussions laced with talk of 'possible worlds'. I shall have much more to say about possible worlds in due course. At present I rest content with the observation that philosophers today find talk of possible worlds irresistible whenever questions arise about what is possible, or impossible, or necessary, or in explaining what it could mean to say that something that did not happen might have happened. Something is possible if it occurs at some world, impossible if it occurs at none. The vase would have shattered had you dropped it if, at worlds closely resembling ours, you, or someone very like you, drops the vase, or a vase closely resembling this one, and it shatters.

By my lights, the extreme difficulty of understanding what makes it the case that something is possible or impossible, what makes it true that the vase would have shattered, is obscured by easy talk of possible worlds. As philosophers reckon them, possible worlds are there for the having. But to declare that something is possible because it occurs at some world is really just to assert in a pointlessly indirect way that it is possible. If the question is, what is the source of possibility and necessity, what makes claims about possibilities, impossibilities, and necessities true, appeals to possible worlds simply reiterate what is at issue.

So I prefer 'universe' to 'world' because this helps to keep at bay the idea that ours is just one among many universes. Maybe it is, but that would need to be shown and its relevance to what is or is not possible here and now defended.

1.6 Truthmaking

Earlier I asked what makes it the case that something is possible, what makes it true that the vase would shatter. In so doing I was invoking the notion of truthmaking, a notion inextricably bound up with ontologically serious metaphysics. The idea is straightforward. When you express a judgment as to how things are—that the vase would have shattered had you dropped it, for instance—you owe yourself and your audience an account of what it is, or might be, about the universe in virtue of which this is true, or failing that, an argument as to why no such account is needed.

I deploy, but do not discuss in detail, the notion of truthmaking throughout this book. My views on the truthmaking relation are spelled out in Heil 2012: chapter 8, but anyone comfortable with truth already implicitly understands what it is for something to make a truth true. Truthmaking is not difficult, although philosophers can make it difficult. We philosophers can make anything difficult.

Accepting that true thoughts or assertions concerning the universe are made true by ways the universe is, commits you to no particular conception of how things are, but it does place a check on unbridled metaphysical enthusiasm. Appreciation of the need for truthmakers is what keeps us honest when we attempt to answer questions in any domain, but it is especially pressing in metaphysics, a domain in which truthmaking is too often marginalized.

1.7 Aristotelianism and Humeanism

Another theme running through the book concerns the relative attractions of 'Humeanism' and 'Aristotelianism'. These labels are not meant to denote the official views of either Hume or Aristotle, but merely to reflect two influential but very different attitudes toward the universe.

Aristotelians hold that things do what they do because they are as they are, because they are so disposed. Objects, including planets, rabbits, tomatoes, and electrons, possess qualities that empower them to behave as they do, affecting, and being affected by, their fellow objects. Tomatoes roll owing to their sphericality, electrons repel one another owing to their respective charges. Formulae and equations that express laws of nature capture the contribution objects' distinctive powers make to their behavior.

In contrast, the Humean picture is of a universe in which objects' interactions are nothing more than a reflection of patterns of regularities. Putting it

somewhat abstractly, what makes it true that *A* causes *B* is that (i) *A* and *B* are spatially and temporally contiguous, (ii) *A* precedes *B*, and (iii) by and large, whenever an *A*-type event occurs, it is followed by a *B*-type event. There is no sense in which individual *A*s bring about or produce particular *B*s. Laws of nature have the form 'whenever there is an *A*, there is a *B*'. So whether it is true that this *A* causes this *B* depends, not on *A*'s and *B*'s specific natures, but on all the other *A*s and *B*s.

For reasons that are not easy to understand, Humeanism became the default during the twentieth century. As the default, Humeanism was given a free pass, while Aristotelian deviations from Humeanism required defense. The thought was that, unless you can establish that Humeanism is false, it retains the crown.

I have suggested already—and not for the last time—that this is not how metaphysics works. In this instance you are faced with a pair of competing worldviews, and the question is, which is more attractive overall, which comports better with common experience and scientific practice? Thus regarded, it seems to me there is no contest: the Aristotelian picture of powerful particulars wins hands down.

Although this is a prominent refrain in chapters to come, I do not think it is the end of the story. In my view, Humeanism has been misjudged both by many of its advocates and by its critics. It could turn out that Aristotelianism is tailored to the manifest image and that a kind of Humeanism is in fact closer to what emerges in the scientific image, the 'could' here being an epistemological for-all-we-know could.

Think of the real Aristotle's physics, often lampooned as hopelessly naive. As physicist Carlo Rovelli has pointed out, however, Aristotelian physics in fact works well so long your interest is in terrestrial bodies moving through fluid media near the surface of the earth (Rovelli 2015). It is true, perhaps, that bodies behave as Aristotle says they do, but why exactly they behave as they do is something else altogether. At this time it is an open question whether the same could be said for what I have been calling Aristotelianism.

Exploring these issues promises to yield a more perspicacious understanding of the point and significance of metaphysics.

1.8 What You Can Expect

For anyone still with me, I am going to offer a brief, chapter-by-chapter summary of what lies ahead. A word of warning, however. It would be easy to read over this summary and lose heart, so you could be forgiven for

skipping it. A tallying up of metaphysical topics is apt to prove intimidating for the uninitiated and trite to the initiated, especially to the initiated who have already made up their minds on the topics. Forewarned is forearmed: you are on your own.

Chapter 2, *Ontological Categories*, provides a preliminary account of categories of what there is, starting with the idea that we are surrounded by things that interact in various ways. Refining this idea leads to thoughts of three seemingly indispensable categories: substance, property, relation, although you could have doubts about the standing of relations alongside substance and property. The chapter includes discussion of various other traditionally important candidate categories, most notably that of attribute, a category deployed by Descartes and Spinoza, among others.

Substance and Property are explored in Chapter 3. Substances are property bearers, properties are particular ways substances are. On such a conception, properties are modes, modifications of substances, not universals, not repeatable, 'general' entities. Substances are simple, lacking parts that are themselves substances. Ordinary objects are probably not substances, hence not property bearers. You could think of modes as qualities of substances that empower those substances in distinctive ways. Qualities and powers of complex objects resolve themselves into the qualities and powers of their constituents organized as they are.

Chapter 4, *Essences, Kinds, Universals*, takes up essences, which I contend, following E. J. Lowe (and Aristotle and Locke on their better days), are not entities. To grasp the essence of something—a rabbit, for instance, is to have a sense of what it takes to be a rabbit. Universals are perhaps best regarded as essences. Were that so, universals would not be distinctive kinds of entity, a thought in keeping with a conception of properties as modes. The chapter introduces the notion of 'slippage' in the course of discussing attempts by philosophers to align the manifest and scientific images.

Qualities and Powers, Chapter 5, revolves around a conception of properties—modes—as 'empowering qualities'. Although the identity of a power is determined by what the power is a power for, this does not turn powers into relations, nor does it require an appeal to transcendent 'Platonic' universals to account for unmanifested powers. Conceptions of powers as 'second-order' properties—properties possessed by an object by virtue of its possession of some other 'realizing' property—appear to be instances of slippage.

Chapter 6, *Qualities Unbound*, steps back and explores the implications of the foregoing conception of properties for attempts to understand conscious

minds and their place in the universe. Physics explains why things do what they do by identifying their powers, abstracting from things' qualitative natures. The silence of physics on the topic of qualities encourages the thought that physics eschews qualities, thereby marginalizing qualities of conscious experiences along with all the rest. Accepting that properties, including the properties of quarks and leptons, are empowering qualities opens the way to the possibility of understanding of how minds might comport with the universe as characterized by physics.

In Chapter 7, *Causation*, reasons are advanced to think that causation, ordinary efficient causation, is the cooperative manifesting of powers. Thus regarded, instances of causation could be seen as genuine bringings about. Given that the identity of a power hinges on what it is a power for (in concert with various reciprocal powers), causal relations would turn out to be 'internal', fully deterministic relations: if you have the powers distributed as they are, you have the manifestations. A conception of this kind, an Aristotelian conception, could be contrasted with a competing Humean conception of causation that appeals to laws, contingent extrinsic factors taken to underlie causal sequences.

Chapter 8 addresses *Emergence and Downward Causation*, topics best characterized by reference to one another. Downward causation would occur when a whole, which includes various parts, influences the behavior of those parts. A whole, or a property of a whole, is emergent when it is capable of exercising downward causation. The term 'emergence' is by no means univocal, but this is one way to understand robust 'ontological emergence'. The need for—indeed the intelligibility of—emergence in this sense is questioned: its proponents appear to be ill-advisedly committed to a corpuscularian universe. This chapter foreshadows a motif running through the remaining chapters: the Aristotelian picture of objects interacting and influencing one another could well turn out to be most at home in the manifest image.

Hylomorphism occupies Chapter 9. Hylomorphism is a doctrine associated with Aristotle and his medieval progeny according to which objects are 'compounds' of matter and form. Two strands of contemporary hylomorphism are considered, one of which appears to invoke the kind of downward causation scrutinized in Chapter 8. Concerns are raised about the status of motion and efficient causation in Aristotle's seamless universe of stuffs, a topic that resurfaces in subsequent chapters.

Chapter 10, *The Art of the Possible*, addresses the status of modal discourse: judgments concerning contingency, necessity, possibility. An Aristotelian conception of the universe as populated by interactive objects would appear,

on the face of it, to provide ample truthmakers for modal judgments, unlike a Humean universe of the kind embraced by D. C. Williams and his student, David Lewis. This impression does not survive scrutiny, however. Humeans and Aristotelians alike are obliged to reconstrue modal discourse in a way that reflects pressures arising in the manifest image, but leaves the modal texture of reality untouched. Once you move below the surface, you recognize that contingency, the idea things could have been otherwise, is a metaphysically vexed concept.

Chapter 11, *Brute Fact*, extends this line of thought about contingency. Paths that start with Hume and Aristotle appear, surprisingly, to converge in Spinoza. Out of the gate this might strike you as implausible. A variety of independent considerations point toward convergence, however, and its implications are momentous.

Chapter 12, *Roots of Things*, and its companion, Chapter 13, *Reconciliation*, tie these themes together with the aim of depicting the manifest and scientific images as ultimately unified: the scientific image gives us an account of what the manifest image is an image of. The nature of the truthmakers for truths embedded in our Aristotelian manifest image could turn out to be Humean in the manner of Spinoza.

A sonnet must have 14 lines, and a book ought not to conclude with a Chapter 13. Chapter 14, *Agency*, comprises an attempt to illustrate how the reconciliatory line advanced in Chapters 12 and 13 might work in the case of free will, arguing that agency and responsibility belong to the manifest image and would survive unscathed even if physics turned out to be rigidly deterministic.

An *Epilogue* that includes a brief reflection on F. H. Bradley's *Appearance and Reality* brings down the curtain on the affair.

Best wishes for a safe journey.

2
Ontological Categories

> Metaphysics is the thoroughly empirical science. Every item of experience must be evidence for or against any hypothesis of speculative cosmology, and every experienced object must be an exemplar and test case for the categories of analytic ontology.
>
> D. C. Williams 1953: 3; 1966: 74

2.0 Analytic Ontology

Metaphysics as I understand it is not a technical endeavor, not an exercise in shock and awe, but a measured approach to a host of compulsory problems, including the problem of understanding the relation appearance bears to reality. By way of illustration in Chapter 1 I invoked the project of reconciling the everyday manifest image of ourselves and our universe and the image we inherit from the sciences, especially physics. In this chapter I propose to introduce some of the machinery that will play a role in an attempt at reconciliation. Many of the topics addressed here will be discussed in more detail in subsequent chapters.

The starting point is ontology, the systematic specification of categories of being, an accounting of the kinds of thing there are, which lies at the heart of metaphysics. The inspiration is Aristotle's *Categoriae*, but I am content to leave interpretive issues in the more capable hands of historians. I recognize that the notion of an ontological category is a term of art differently regarded by different philosophers. That being so, there is no univocal, antecedently correct accounting of categories, no immediately satisfying answer to the question, what is a category, or the question, what should be included in or excluded from an exhaustive list of categories.

Perhaps this is unsurprising. We philosophers are at our worst when, instead of philosophizing, we try to philosophize about philosophy. Good philosophers, when pressed to say what philosophy is, can be beguiled into offering nebulous generalizations that are at best loosely related to what they

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do when they roll up their sleeves and engage in serious philosophical reflection.

In this regard, philosophy is no different from mathematics, or geology, or poetry. People good at mathematics, or geology, or poetry need not be good at saying what it is that they are good at doing. You can be supremely competent at a given activity without being at all competent in discussions of the nature of that activity. Think of tying your shoes as distinct from spelling out what it is you are doing when you tie your shoes. Or think of an athlete who has mastered a certain skill but could not begin to explain what is involved in its exercise.

Some philosophers—and many arbiters of science and common sense dismissive of philosophy—appear to believe that, before being entitled to engage in metaphysics, you would first need to establish metaphysics' legitimacy, and before metaphysics' legitimacy could be assessed, you would have to say clearly what metaphysics is, what precisely metaphysics encompasses.

The thought that you are not permitted to engage in an endeavor until you have provided a fully adequate characterization of that endeavor would, if uniformly enforced, leave us perpetually at the starting gate. If the legitimacy of mathematics, or geology, or shoe-tying turned on our capacity to specify in advance the nature of mathematics, or geology, or shoe-tying, we would still be wandering in the wilderness eating berries and shuffling about in straw sandals.

Instead, we have by and large done what needed to be done as best we could, and left discussions of what it is we are doing to those lacking the initiative or feel for the activities themselves. Illuminating accounts of a field or practice typically appear, if at all, only after the practice or field is already well established.

So it is with ontological categories. Philosophical discussion of categories is a meta-enterprise, an activity to be distinguished from the deployment of categories in first-order metaphysical undertakings. Meta-discussions of metaphysics generally and ontology in particular are invariably highly abstract, while hands-on ontological engagement is a visceral enterprise. As C. B. Martin, liked to put it, metaphysics, and in particular, serious ontology, has as much to do with the gut as with the cerebral cortex, probably more.

At any rate, this is how I feel about setting out to address the topic of ontological categories. I am comfortable deploying various categories, but uncomfortable saying what it is I am deploying. The best I can do is invoke examples—substance, property, and relation, for instance—of what have historically been called categories. I accept, with an important qualification, that

there are substances, properties, and relations. If these are categories of entity, then I accept that there are categories of entity. These categories are not themselves entities, however, nor are they concepts or linguistic devices, although certain concepts, certain terms might be required to express them.

Essences afford a useful comparison here, at any rate essences in what I take to be an Aristotelian sense, according to which an essence is *what it is or would be to be* an entity of a particular kind, a horse, for instance (see Furth 1988; Lowe 1998, 2008a, 2012; Fine 1999, 2008, 2010; Evnine 2016). A horse's essence is not an entity, a constituent or feature of the horse, but what it is, or would be, to be a horse, more prosaically, what it takes to be a horse.

I realize that thinking about essences in this way places me at odds with a thesis commonly taken to be central to Aristotle's mature metaphysics, according to which objects are said to be 'hylomorphic compounds' of substantial form and matter, where substantial forms are identified with essences. If essences are substantial forms, and substantial forms are components or ingredients of substances, then essences would appear to be entities.

I offer an alternative and possibly revisionary interpretation of Aristotle in Chapter 9. My interest lies not in promoting Aristotelianism, however, but in uncovering, as D. C. Williams puts it, 'the traits necessary to whatever is, in this or any other possible world' (Williams 1953: 3; 1966: 74).

If, as I am contending, an essence is what it would be to be an entity of a particular kind, every entity *has* an essence. Grasping something's essence would be, among other things, to grasp what it takes to be the kind of something it is. Philosophers speak here of 'individuation'. You are in a position to identify and distinguish objects, tomatoes, for instance, when you know, whether you could put it into words or not, what counts as a tomato. To complete the story, you need a sense, as well, of an entity's identity conditions, what it is for a given something to be one and the same something—the tomato on your kitchen counter today and the tomato you selected on a trip to the supermarket yesterday.

Amie Thomasson (2007, 2016) suggests that identity conditions provide a straightforward way of distinguishing categories. Her idea is that, only if entities share identity conditions, do they belong to the same category. This is helpful, but it does not, nor is it meant to, provide a mechanism that could yield an exhaustive list of categories. Because that is not my concern, however, I am happy to note Thomasson's suggestion, and move on.

If obliged to speak of categories, I would begin by appealing to the three mentioned earlier, substance, property, and relation, with the proviso that the third of these, relation, could be, in a sense to be explained, recessive. On some

accounts, substance and property each encompass two categories (see, for instance, Lowe 2006). Under the category of substance, there are substantial universals and instances of these, individual substances; in the case of properties, nonsubstantial universals and their instances, accidents, tropes, or modes. I am sympathetic to such views, but I place universals in the same camp as relations. (I return to universals in Chapter 4.)

Two matters bear mention before moving ahead. First, in attempting to advance an exhaustive listing of categories, are we meant to consider only categories that have instances, or are we to include categories that, as far as we know, could, but do not, have instances? Again, because I regard 'category' as a term of art, I doubt that there is a determinate answer to this question.

Second, what of categories, instances of which, apparently turn out to be 'nothing over and above' instances of other categories? Are these themselves categories or are they merely categories-by-courtesy? It is possible that less is at stake here than meets the eye, but saying why this might be so requires addressing the notion of truthmaking.

2.1 Truthmaking and Foundedness

Serious ontology calls for a willingness to take a stand on what the truthmakers might be for substantive ontological claims. The idea, introduced in Chapter 1, can be illustrated with an example.

Some philosophers have thought that causal and dispositional claims are best expressed by means of targeted counterfactual and subjunctive conditionals. If a bat's striking a ball caused the ball to sail over the boundary, it would seem that, other things being equal, had the bat not struck the ball, the ball would not have sailed over the boundary.

This is sometimes thought to represent an advance over ordinary causal talk, the idea being that causal discourse is analyzable or paraphrasable into counterfactual locutions. But, it seems fair to ask, if causal judgments are to be understood as expressing counterfactuals, what are the truthmakers for these counterfactuals, what is it about the universe in virtue of which the counterfactuals are true?

At this point philosophers today are apt to revert to talk of alternative universes: roughly, a counterfactual is true when no possible universe at which its antecedent is true and its consequent false is closer to—that is, more similar to—the actual universe than universes at which both the antecedent and the consequent are true. Philosophers divide over the question whether alternative

universes are, like ours, concrete, or merely *abstracta*, on a par with numbers or sets, or perhaps merely useful fictions. (If they are fictions, it would be fair to ask what makes them useful.)

Although I regard the invocation of alternative universes as deeply fraught, I shall not pursue the point here, but return to it in Chapter 10. My sole motivation for mentioning counterfactuals (and alternative universes) is to call attention to the role of truthmakers in ensuring ontological candor, arguably the most important virtue in the metaphysical enterprise.

Now consider relations. In introducing the topic of ontological categories, I suggested that substance, property, and relation looked promising as representative categories of entity, while evincing qualms about relations. My thought was that truthmakers for relational claims could turn out to be nonrelational features of the universe.

How would that work? Think of the taller-than relation. Suppose Gus is taller than Lilian: Gus bears the taller-than relation to Lilian. This could be because Lilian is 1.6 meters in height and Gus is 1.7 meters. Assuming that their heights are intrinsic features of Lilian and Gus respectively, these nonrelational features of the universe make true the relational claim that Gus is taller than Lilian: a relational truth with nonrelational truthmakers. (Do not be distracted by the numerical measurements. These simply provide a way to expresses the differences in height responsible for its being the case that Gus is taller than Lilian.)

Although I believe that this is how it is with relational truths generally, my aim for the moment is simply to illustrate what I see as an important ontological move. Suppose that truthmakers for relational truths were invariably nonrelational features of the universe. The relational truths are true, so it would be a bad idea to describe the situation as one in which relations are 'eliminated' or 'reduced' to something nonrelational. Instead, you might follow tradition and characterize relations as being *founded*: relations obtain in virtue of nonrelational states of the universe. In saying this, I am echoing Leibniz (1715; see also Campbell 1990: chapter 5, for an especially perceptive account of the foundedness of relations).

It is tempting to speak, as Campbell does, of relations thus construed as 'supervening', but the notion of supervenience has a checkered philosophical history, and appeals to supervenience can result in a net loss of information. This is because supervenience is often given a modal characterization and taken to express a relation among properties or families of property (for an excruciatingly detailed discussion of various supervenience relations, see Heil 1992: chapter 3).

Mental properties are said to supervene on physical properties provided two things could not differ mentally unless they differed physically. When this is so, however, when the *A*s supervene on the *B*s, it could be so for a variety of reasons (see Kim 1990; Heil 2012: 159–63). Here are a few:

(1) the *A*s *are* the *B*
(2) the *A*s are *made up of* the *B*s
(3) the *B*s are *determinates* of determinable *A*s
(4) the *B*s causally *suffice* for the *A*s
(5) the *A*s and *B*s both causally *depend* on the *C*s

When philosophers invoke supervenience, then, it is fair to ask them what precisely they have in mind. Simply appealing to supervenience simpliciter leaves open too many possibilities, yielding an information deficit. Matters are not measurably improved when you move from talk of supervenience to talk of 'grounding', a term that has different meanings for different philosophers in different contexts.

In invoking foundedness in the discussion at hand, what I have in mind is nothing that appears in the list above, but simply truthmaking: if relations are founded, relational truths have nonrelational truthmakers.

Although I understand foundedness in terms of truthmaking, I shall continue to speak of foundedness because it is a traditional label for the relation among ontological categories that I have in mind. To say that an ontological category is founded is to say that truthmakers for truths about instances of that category are instances of some other category or categories.

Peter Simons (2005) distinguishes 'the fundamental classes of thing' and 'factors that determine them', a distinction that could yield something comparable to what I have in mind. *A*s being founded on *B* or *B*s making talk of *A*s true, however, like entailment, is not an analytic relation. Unlike entailment, the relation requires both *relata*: something true and something that makes what is true, true.

For the uninitiated, entailment is a relation that holds between 'truth evaluable' entities: sentences or judgments, for instance, items capable of being true or false. Entailment is not a relation among what the sentences or judgments are about. '*A*' entails '*B*' when '*A*' could not be true if '*B*' is false. The assertion that the tomato is red entails the truth of the assertion that the tomato is colored. But the tomato's redness does not entail anything; its redness is not something that could be true or false.

In any case, if relations are founded, it is not that they hover above, somehow distinct from, yet dependent on, their nonrelational truthmakers, but that (irreplaceable) relational truths are made true by nonrelational, 'monadic', that is, intrinsic, features of whatever they relate. As noted already, this implies neither the elimination of relations nor their reduction to something else. How could you reduce something to something *else*?

Perhaps the idea is best understood as a way of saying what relations at bottom *are*. Gus stands in the taller-than relation to Lilian. What makes this so is the possession by Lilian and Gus of certain nonrelational, intrinsic characteristics, their respective heights. This is what makes it true here and now that Gus is taller than Lilian.

Pretend for a moment that this is how it is with relations generally. Is relation a distinct ontological category, a category in addition to substance and property? Assuming that relational judgments are irreplaceable, simply denying that relation is a category would be potentially misleading, but including relation as a category alongside substance and property would be equally misleading. If relations are founded, there could be irreducible relational truths, but the truthmakers for these are nonrelational features of the universe. Are there relations? Yes, but relations are founded, relational truths are made true by nonrelational ways the universe is.

2.2 Other Categories

None of the foregoing is meant as a defense of the idea that relations are in fact founded, although I suspect they are for reasons to be advanced below and in later chapters (for recent discussion see the contributions to Marmodoro and Yates 2016). My aim is only to illustrate what I have in mind in speaking of foundedness. I am working up to the suggestion that the categories of substance and property are categories enough, with the caveat that relations might or might not need to be included in this list. And in saying that substance and property would suffice, I mean that, if you have the substances and the properties, you have instances of any other categories that have instances.

What other categories? Facts and states of affairs might come to mind. If a state of affairs is a substance's possessing a property, then, if you envisage a substance's possessing a property, Socrates' being pale, for instance, you have envisaged a state of affairs. If a fact is an obtaining state of affairs, then, if you have a substance's possessing a property at a time, if Socrates is indeed pale, you have a fact.

If this seems controversial, that could be because you are thinking of properties as universals, repeatable, multiply locatable, general entities. Were properties universals, then an obtaining state of affairs would require more than a substance and a property, it would require something binding the substance and property together: the substance's 'instantiating' or 'exemplifying' the property. God, in creating the substances and the properties, would, in addition, need to allocate the properties across the substances, their instances. And if you are thinking about instantiation (or exemplification, a qualification I shall henceforth omit) in this way, the instantiation relation would not be founded, so relations would be back in the picture.

I am not thinking of properties as universals, however. I am thinking of properties as modes, fully particular modifications of individual substances, ways individual substances are. 'Mode' comes from the Latin *modus*, one meaning of which is *way*.

Socrates is pale. Socrates' paleness is a mode, a way Socrates is. Socrates' paleness owes its identity to Socrates. God does not create Socrates and a paleness, then conjoin them so as to produce a pale Socrates. Creating Socrates' paleness would be a matter of modifying Socrates in a particular way. Socrates' paleness could not exist apart from Socrates any more than a bruise on your forearm could exist apart from your forearm. Like the bruise on your forearm, Socrates' paleness could not be or have been anyone else's paleness.

Some readers will wonder why I speak of modes rather than individual accidents, Aristotle's label, or tropes, a more recent addition to the philosophical lexicon. My aim is to avoid unhelpful associations.

Take accidents. In the hands of various medieval philosophers, conceptions of accidents evolved so as to allow some accidents, so-called real accidents, to persist independently of the substances to which they once belonged. This led to the introduction of modes as a species of accident that could not survive apart from the substances they modified.

What of tropes? Nowadays, philosophers who speak of tropes often do so in the context of embracing a one-category trope ontology that takes substances to be collections or bundles of tropes. Indeed, Williams, who introduced the term 'trope' as a label for particularized properties held just such a view. Not all trope theorists are bundle theorists, so, to forestall confusion, I favor the traditional 'mode'.

Notice that if you follow Williams and regard tropes as the alphabet of being, it would seem that God must create the tropes, and arrange them, in which case obtaining states of affairs would not be founded. Socrates' being

pale would be a matter of the bundle of tropes making up Socrates including a particular paleness trope, a trope that could just as well have belonged to a distinct bundle. That would be an interesting thought, but not a thought I would want to endorse.

Properties construed as modes are not ingredients, not in any sense parts of substances, not items attached to substances, but modifications of substances, ways substances are. And what of substances? Substances are neither assemblages of properties, nor featureless substrata, 'bare particulars' clothed in properties. Substance and mode are correlatives. To be a substance is to be something that is various ways, and to be a way, to be a mode, is to be a way some substance is. An electron is various ways. When you have described these ways, you have described the electron.

Perhaps the electron has, in addition, a spatial location and a temporal duration. Are these unfounded characteristics of the electron? That will depend on whether spatial and temporal relations are founded. Whether God, in creating an electron must, in addition, assign it a spatial location and give it a temporal duration is, by my lights, a nontrivial question. Suppose electrons turned out to be energy concentrations in fields, ways fields are, modes, not substances. The fields would inherit the substance role. In that case, an electron, like the bruise on your arm, would have its spatio-temporal location essentially: the electron's being where it is in spacetime would be part of what it is to be this very electron.

2.3 Spatial, Temporal, and Causal Relations

Suppose that electrons are substances in their own right, not modes. This would be so if electrons were, as they are commonly regarded, particles. Would this make their being in particular locations unfounded relations? Emily Prychitko helped me to see that every electron must have some spatio-temporal location or other. Just as God (or the Demiurge, or chance, qualifications henceforth omitted) could not create a mode—Socrates' paleness—without making it a mode of some substance, a modification of Socrates, so God could not create a material substance without creating it somewhere and somewhen, creating it at some time in some location or other.

Consider spatial locations, as distinct from their occupants. They, the locations, are essentially the locations they are. A particle might shift from one location to another, but a location could not shift to another location, a location could not have been somewhere else. Locations are not parts of space

in the way stones are parts of a wall. Dependence relations between stones and the wall they make up are the converse of those between spatial locations and space. You need the stones to make the wall, but you need space as a whole to make the spatial locations. And what goes for spatial locations goes for temporal locations and, by extension, locations in spacetime. What makes it the case that an electron has the location it has, then, is that its location is the location it is.

Note that it would be a mistake to conflate the question, what *brought it about* that the electron is where it is, a causal question, and the question, what *makes it the case*, what makes it true, that the electron is here, given that it is where it is (for whatever reason). Asking what makes it the case that the electron is here, is to ask what the truthmaker is for 'the electron is here'. Even if the electron could have been elsewhere, it must be somewhere. What makes it the case, what makes it true, that it is in this location, rather than some other, is that its location is the location it is. (The foregoing is meant to echo Campbell 1990: chapter 5.)

The point is difficult because it is so simple and, in consequence, easy to overthink. Consider the location of a chess piece on a chess board. Each square on a chessboard owes its identity to the entire board, including all the other squares. Imagine that a black knight is in its initial position on a particular square, *c*6. The knight could be moved to other squares, but it is now located on this square. What makes it the case, what makes it true that the knight is located on *c*6? The knight is where it is: *c*6. To be in play the knight must be on some square, after all, and where it is, is square *c*6.

Again, it would be a mistake to confuse the question, what makes it the case that the knight is where it is, square *c*6, with the question, what brought it about that the knight came to be where it is. Perhaps the knight is on square *c*6 because that is where you placed it.

Of course your placing a chess piece on a chess board differs importantly from God's creating an electron and locating it somewhere. You hover the piece over the board, then set it down. But God does not manufacture an electron, pluck it up, and set it down somewhere in space. In bringing an electron into being, God cannot but bring it into being at some time and at some spatial location.

The idea here is that relations between objects and their spatial and temporal locations are what philosophers call internal relations, so something's being at a particular location is an internal relation. This is simply another way of saying that the relation is founded. To be, a material object must be somewhere: every object is somewhere and, as it happens, the somewhere it

is now, is here. Here, a point or region of space could itself be nowhere else. The identity of a point or region of space is fixed by its location. What makes it true that the object is here? Well, the object is somewhere now and that somewhere is here.

Am I right in describing spatial locations as being where they are essentially, they could not be or have been anywhere but where they are? Space—or spacetime—bends and expands. When this occurs, when spacetime expands, for instance, regions of space would seem to move further apart. This represents a misunderstanding of what it is for space to bend or expand.

Imagine a rubber sheet with a dot of paint marking a particular location on the sheet: where the location goes, so goes the dot. Now stretch the sheet. The dot, and with it the region it occupies, moves!

Notice that, to say the region occupied by the dot moves, is not to say that it moves across the surface of the sheet, exchanging places perhaps with other regions or occupying regions vacated by regions that themselves have moved on. The region moves because the imagined sheet is *itself* in space. Were the sheet space itself, the region occupied by the dot could not move: it has nowhere to go.

What about ordinary spatial relations among objects? Imagine a golf ball's rolling across the green and stopping just short of the cup—6″ short. The ball is now at a particular location. What makes it true that it is in that very location is that the ball is where it happens to be—it must be somewhere—and where that is a small region of space close to another region of space that includes the cup. The identities of the regions of space occupied by the cup and by the ball, respectively guarantee that they are 6″ apart, so their being 6″ apart is an internal, founded relation. The ball and the cup are related internally to their respective locations, and the locations are related internally to one another, so the ball's being 6″ from the cup would seem to be an internal relation.

I hope it is clear that what holds for spatial relations would hold, as well, for temporal and spatio-temporal relations. God, angels, and the number 7 aside, whatever is, must be in time as well as space, a substantive claim, but one I am comfortable accepting. In any case, what makes it the case that you are here now—as opposed to some other time—is that you are temporally where you are, and where that is temporally, is now.

What of causal relations? Are causal relations founded? When *A* causes *B*, it would seem that *A* brings about *B*. When a stone tossed into a pond causes a splash, it looks as though the stone brings about the splash. Some philosophers, the Humeans, are distrustful of this way of thinking of causation.

What you have is the stone's striking the surface of the water, and the water's subsequently reconfiguring in a characteristic way. What makes this an instance of causation is not that the stone brings about a certain result, but that the sequence is an instance of a true generalization, roughly: in general, when stones strike surfaces of water, a splash ensues.

Wherever your sympathies might lie, would it be plausible to think that causal relations are founded? Or are causal relations a species of unfounded external relation?

I shall postpone addressing this question at present, but I shall have more to say about causation and relations generally in Chapter 7. In the end, I hope to persuade you that relations are, one and all, founded: once you have the propertied substances, once you have the substances and the modes, you have all the truthmakers you need for all the truths that have truthmakers.

2.4 Universals

Relations aside, I am supposing that properties are modes, ways particular substances are. This makes properties themselves kinds of particular. To say that two objects *share* a property, that they have the *same* property would be to say that they are similar in respect to that property. In most cases, objects are not similar *tout court*, but similar in particular respects. The 'respects' are properties, which *are* similar (or not) *tout court*. Socrates' paleness is identical to, not with, Simmias' paleness.

Similarity is a splendid example of a founded relation. To make Socrates and Simmias similar with respect to their complexions, God need only modify Simmias and modify Socrates in the pale way: God need only make Socrates pale and Simmias pale. If you have these palenesses, you have Socrates' and Simmias' being pale.

What of universals, philosophers' distributed properties, *entia generalia*? Although I once was not, I am now at peace with talk of universals, just as I am at peace with talk of relations, states of affairs, and facts. This is because I have come to see universals as founded, hence ontologically unremarkable. The truthmaker for 'Socrates and Simmias share a property' or 'Both Socrates and Simmias are instances of paleness' is Socrates' and Simmias' respective palenesses, Socrates' being the pale way, and Simmias' being the pale way.

What I reject, in embracing modes, is the idea that universals make up a distinctive category of general entity. I believe I am in good company here, but this is another thesis I shall not pause to defend. I return to it in Chapter 4. If

I am wrong about universals and if I am wrong about relations, universal, relation, state of affairs, and fact would be unfounded categories, categories alongside substance and property.

Why imagine that universals are founded? Start with Socrates' paleness, a mode, and consider what it is, or would be, to be pale, what it takes to be pale. You could think of this as the essence of paleness. Socrates' paleness is one instance of what it is to be pale, Simmias' paleness is another. The two palenesses have the same essence, not merely in the sense of having similar or exactly similar essences, but in the sense of having one and the same essence.

Here the essence appears to fill the role of a universal. Does this mean that the essence is a universal? Suppose it is. Given that essences, as I have characterized them, would not be entities, it would follow that universals are not entities, not general, multiply-locatable entities, not residents of a transcendent Platonic realm of forms.

Assimilating universals to essences in this way yields an interesting result. In addition to accidents—properties, my modes—Aristotle embraces substantial forms (see *Metaphysics* Z, 4). A substantial form has as instances, not properties, not individual accidents, but individual substances. Pretending for the moment that horses are substances, Phar Lap would be an instance of horsehood, Phar Lap has what it takes to be a horse. Phar Lap's color (as distinct from Phar Lap) is an instance of brownness. If every entity has an essence—what it is or would be to be an entity of that kind—both Phar Lap and Phar Lap's color have, and indeed are instances of, essences. And if you identify essences with universals, this leads to at least two classes of universal: substantial universals and property universals.

Whether there might be other kinds of universal depends on whether there are other unfounded categories of entity. Suppose I am right about relations and states of affairs. What it would be for one thing to be taller than another is for the two things to have the right kinds of intrinsic property. What it would be for something to be spherical, a state of affairs, would be for the something to be the spherical way. If relations and states of affairs are founded, their essences are as well and, if universals are identified with essences, the same would hold for the universals.

2.5 Attributes

In favoring a conception of properties as modes, I am aligning myself with various scholastic and early modern philosophers, including Descartes and

Spinoza. At one time I read both Descartes and Spinoza as embracing a three-category ontology of substances, attributes, and modes. In the course of writing this chapter, however, and thanks to Yitzhak Melamed and Noa Shein, I underwent something of a conversion on this topic (see Melamed 2013; Shein 2018; see also Garrett 2017). I now think that, unlike substances and modes, attributes are not a category of entity.

But what is an attribute, if not simply a property? Both Descartes and Spinoza identify attributes with essences. Descartes, for instance, speaks of an attribute as constituting a thing's 'nature and essence' (1644: I, § 53). In the *Ethics*, Spinoza puts it this way: 'by attribute I understand what the intellect perceives of a substance as constituting its essence' (part 1, 4th definition, quoted in Melamed 2013: xviii). For Descartes, what makes a material body a material body, for instance, is its being spatially extended, its occupying a region of space: a material body *is* an extended substance. Properties of material bodies would be modes of extension, ways of being extended. A spherical body would be a body extended in the spherical way.

I am neither prepared nor equipped to pursue interpretative questions concerning attributes as these are understood by Descartes and Spinoza (see Shein 2018 for a useful discussion). My aim here is simply to offer an account of attributes that is at least consistent with what Spinoza says about them, and Spinoza takes himself to be making explicit what is, in Descartes, largely implicit.

Descartes holds that every substance has a single defining attribute. There are, he thinks, two kinds of created substance: material substances and thinking substances, minds. God, the creator and sustainer, is a third kind of substance, an infinite substance, but my focus will be on created substances. A material substance is extended, extension being its attribute. Properties of a material substance are modes of extension, ways of being extended. Minds, in contrast, are not extended. Minds are thinking substances, where thinking is meant to include any sort of conscious state or activity. Minds think, their attribute being thought, and properties of minds are modes of thought, ways of thinking, ways of being conscious.

Consider just Cartesian material extended substances. What relation would a material substance bear to its attribute, extension? A material substance *is* its extension. This might suggest that the attribute, extension, is strictly identical with the substance, but this would be a misunderstanding. Extension is said to be the essence of a material substance, and an essence is what it is to be a substance of that kind, in this case, what it is to be a material substance. If an essence is not itself an entity, it is not a candidate for being strictly identical

with an entity, a substance. Being extended is just what it is to be a material substance. Here is a material substance. What is it? It is an extended something, an extended substance.

Spinoza differs importantly from Descartes in allowing that a substance can have more than one attribute. One and the same substance could be both extended and thinking. Any such substance would be an extended substance and a thinking substance, a substance having what it takes to be extended—hence a material substance—and having what it takes to think, to be conscious—a mental substance.

To be sure, Spinoza and Descartes differ in other respects as well. Spinoza contends that there is just one substance, the universe as a whole, which he identifies with God, and that this substance has, not just the two Cartesian attributes of thought and extension, but an infinity of attributes.

One important consequence of a view of this kind is that, what you might ordinarily think of as candidate substances—particles, rocks, rabbits, human beings—are in fact modes, modifications of the one substance, ways the one substance is. Although the prospect that concrete objects could turn out to be nonsubstantial modes of some encompassing substance might strike you as outrageous, it will assert itself regularly in the chapters that follow.

What of Descartes? Descartes, unlike Spinoza is a pluralist about substances: there are many mental substances, many minds. What is less clear is whether Descartes was a pluralist about extended material substances (see Bennett 2001, chapter 5, and Lennon 2007). Perhaps Descartes, like Spinoza, held that there is just one extended substance, space itself, and what we think of as material bodies are in fact modes, modifications of this one substance. In that case, particles might be localized disruptions of space, rabbits much more complicated disruptions.

Odd as this prospect might appear, it leaves the categories of substance and mode intact. It suggests only that we should be broadminded when it comes to thinking about what the substances and properties—the modes—might turn out to be.

2.6 *Abstracta*

What of *abstracta* beloved by philosophers: numbers, sets, classes, propositions? Consider propositions. Some philosophers identify propositions with states of affairs: the proposition that Socrates is pale is the state of affairs of Socrates' being pale. The proposition is true if the state of affairs obtains, false

otherwise. If this is what propositions are, what I have said about states of affairs applies straightforwardly to propositions.

Other philosophers regard propositions as abstract representational entities, entities themselves capable of being true or false. I confess to being mystified by such entities, entities that have meaning—in virtue of which they could be true or false—intrinsically. Everything we know about meaning suggests that no entity has or could have its meaning intrinsically. Propositions thus construed have all the marks of ad hoc philosophical posits, the sole evidence for which is that, were there such things, they would provide solutions for various self-inflicted philosophical problems.

If, in contrast, propositions are understood as what a thought, for instance, or an assertion means, then propositions would appear not to be entities at all, hence not instances of a category of entity. If you have a meaningful representation, you have what that representation means. It would be hard to find fault with propositions so understood, but neither do they pose any sort of ontological challenge. Given the potential for misunderstanding, however, I prefer to avoid mention of propositions in discussions of metaphysical topics.

I do not imagine that these comments provide anything approaching a definitive refutation of the possibility of propositions considered as truth-evaluable *abstracta*. My reservations might be nothing more than manifestations of a lack of imagination on my part. And if I am wrong, then propositions would appear to constitute a category of entity distinct from any considered thus far.

What of numbers, sets, classes? If these are taken to be special, unfounded categories of entity, residing perhaps 'outside' spacetime, they would seem to inherit the disreputable character of propositions, posits lacking independent motivation. And, as in the case of propositions, if I am wrong about this, the distinctive essences of such entities would seem to call for distinctive categories. (For further discussion, see Heil 2012: 168–76.)

2.7 Modality

As noted earlier in my comments on counterfactuals, it is hard nowadays for philosophers to discuss modality without invoking alternative universes. Necessities hold at every universe, contingencies hold at some universes, but not others, impossibilities hold at no universes at all. The apparatus of alternative universes was spawned by the need to provide a way of accommodating modal talk to a universe altogether lacking in modal character, a

Humean universe in which nothing alters, brings about, or necessitates anything else. Once the Humean picture is called into question, however, the way is open for the return of modality to the universe as it is, a topic to be revisited in Chapter 10.

Setting Humeanism aside, it would seem that some modal judgments, those concerning what objects could or would do, for instance, are made true by those objects' possession of various powers or dispositions. A tomato would roll down the supermarket aisle because it is spherical, where the tomato's being spherical is a matter of the tomato's possessing a quality that disposes it to roll (rather than slide or tumble) across a smooth surface. It is of the essence of sphericality, what it is to be spherical, that sphericality disposes objects that are the spherical way to behave as they do in certain circumstances, and behave differently in others.

Of course, objects, even simple objects such as electrons, are, with few exceptions, many ways. Objects have assorted qualities that variously empower them, thereby determining how they would behave in concert with other objects possessing qualities equipping them with reciprocal powers. And if you accept that properties are in this sense empowering qualities, many modal judgments would be made true by objects' properties. This pegs possibilities and necessities to properties.

It would seem to make sense to ask whether some properties are themselves merely possible, however. Might there be properties that nothing has or ever will have, but that something could have had? And, if so, what, if anything, would make it the case that judgments about such properties are, or are not, true?

Granted it sounds strange to ask whether there could be properties nothing will ever have. How could there *be* something that never is, was, or will be? Reflections of this kind have led some philosophers to 'Platonic' conceptions of properties according to which properties are universals existing of necessity in a densely populated transcendent realm. Other philosophers are comfortable locating unborne 'alien' properties at other universes. However the question really is whether there could have been properties that nothing has or ever will have. And a sensible answer to this question requires recourse to neither transcendent universals nor alternative universes.

Presumably properties present in the universe as it now is were prefigured in properties possessed by objects making up the early universe or in the state of whatever there was prior to the Big Bang. But the question before us is whether the universe could have been different, whether the universe could

have included objects possessing properties wholly alien to those in our universe or its predecessor?

It is hard to know where to turn for answers to such questions because reality, being itself, would seem to have the last word on what is and is not genuinely possible. This is to conceive of reality as having a texture that admits of some variations, but not others. The universe-as-it-is might, or might not, be the only possible universe. This is not something a philosopher is in a position to work out from the armchair. We can hope for enlightenment from physics, but enlightenment is by no means inevitable.

I recognize that this thought is highly contentious. Philosophers who have—all too often, unreflectively—taken on board a Humean frame of reference instinctively regard contingencies as cost-free, and necessities as in need of defense. But contingency is a modal concept. A relentlessly Humean universe admits of neither necessities nor contingencies. Pronouncing features of the universe, laws of nature, for instance, contingent is not something to which a Humean is entitled.

Once you move beyond Humeanism, it is not easy to see how substantive modal claims about the universe could be supported a priori. What is in fact possible is constrained by being, by reality, and these constraints could prove to be beyond our ken. For all we know, Spinoza was right: the universe, just as it is, really is the only possible universe: all the possibilities are rooted in what there is.

The strange idea that necessities require defense while contingencies come for free is a toxic by-product of philosophers' infatuation with interpretations of modal discourse relying on thoughts of alternative 'possible' universes. But sauce for the goose is sauce for the gander. Claims concerning contingency, no less than claims concerning necessity, call for defense. And because a determination of reality's constraints poses epistemological obstacles of the highest order, the proper attitude in this case is one of humility. All such claims are deeply fallible and open to question.

My suggestion is that our access to constraints imposed by reality is in the hands of the physicists. All the sciences are in the business of adding to and subtracting from what we accept as truths about the universe, but the role of physics is to get at the nature of the truthmakers for truths that have truthmakers. There is no guarantee that we will ever sort it out, and every expectation that we will not. Civilization could expire before we approach anything close to a definitive accounting of reality, or reality could forever elude our persistent efforts to understand it. Our best confirmed theories could work flawlessly while providing little or no guidance as to what the universe would have to be like were they true.

Physics today offers various competing depictions of reality, all of which appear to involve propertied substances. Suppose the universe consists of particles distributed in spacetime. Particles are substances, and spacetime is certainly substance-like. Suppose the particles turned out to be disturbances in fields, or in spacetime itself. In that case, the particles would be, not substances, but modes, local modifications of fields or spacetime, with fields or spacetime taking on the substance role. String theory seems no longer to be on the table, but if string theory had panned out, the substances would be vibrating superstrings.

One notable competitor to this picture, 'ontic structural realism', replaces substances and properties with relations: substances and properties are founded on relations (see, for instance, Ladyman et al. 2007; Esfeld 2016, 2020; for discussion see Chakravartty 2017). Proponents of this picture argue that it is demanded by quantum physics or by any theory unifying quantum physics and general relativity, 'loop quantum gravity', for instance (see, e.g., Rovelli 2016).

You could accept that equations used to express any such theory might incorporate irreducibly relational terms, but we knew that already, and, in any case, its ontological implications remain obscure. One problem besetting quantum theory is that of saying what the universe must be like if it is true, characterizing the nature of the truthmakers. This is the problem of settling on an 'interpretation' of the theory, and, as matters now stand, there is scant agreement among physicists as to which interpretation is to be preferred.

This is not to suggest that interpretations of quantum theory that make relations preeminent should be rejected out of hand or resisted on wholly a priori grounds, but only that it is extremely unclear what a relational ontology could amount to. The ontology would be one in which substances and properties are founded on relations, a thought I find, if not incoherent, at least perplexing, even if it is formally unexceptionable. When it comes to interpretations of quantum theory, the jury is still out. I return to these issues in Chapter 12.

Quantum theory aside, what of ontologies that replace substances and properties with events or processes? Events and processes appear to be occurrences or happenings 'involving' some thing or things, perhaps occurrences in fields or space or spacetime. Were that so, events and processes would be dynamic modes, shivers, or tremblings, or eruptions, or twinklings of the fields, where the fields are the substances. Could there be twinklings without something that twinkles? Presumably, these would have to occur in space or spacetime, in which case it might be better to say that what twinkles *is* space or

spacetime. And what of space or spacetime? Could these be understood as events or processes?

In evincing scepticism about the alternatives, I am not trying to rescue a substance–property ontology at whatever cost. I am simply endeavoring to understand how there could be an alternative. I like to think that I am open to persuasion on the topic. I remain in the substance–property camp because I have yet to encounter a viable ontologically serious competitor.

2.8 Inconclusive Reasons

Although I believe we can get by with the categories of substance and property, other categories being founded on these, it is no part of my argument that such a picture is to be preferred to its competitors because it is 'more parsimonious'. Parsimony is a norm that comes into play only in the endgame, and then only as a fallible tie-breaker. My speculative contention is just that a substance–property ontology—where substance and property are correlative: substances are various ways, and these ways are properties—does the job. As John Buridan puts it in a related context,

> I do not believe that this conclusion is demonstrable, but merely declarable through an induction in which no counter-instance is found . . . .Through such an induction, the intellect, if it does not see a counter-instance or counter-argument, is compelled by its natural inclination to the truth to conclude the universal proposition. (Quoted in Pasnau 2011: 23)

Here Buridan is defending, as does Ockham, an *ex nihilo nihil fit* principle, not a substance–property ontology, but by means of an inductive argument of the kind Williams has in mind in the passage quoted at the outset of the chapter.

My suggestion is that a substance–property ontology has this character. A substance–property ontology is up to the challenge of making sense of the universe, indeed any imaginable universe, in the most general way. It would seem that any universe God could create would include substances and their properties, all else being founded on these. Two categories might be categories enough.

3
Substance and Property

> The ideal aim of systematic knowledge is to disclose the fewest primitive elements into which the most diverse objects are analysable and the fewest primitive facts, singular and general, from which the behavior of things is deducible.
>
> D. C. Williams 1966: 147

3.0 Ontology and Cosmology

Our experience of the universe is an experience of ourselves as objects jostling and being jostled by fellow objects that differ from ourselves and from one another in countless ways. As we begin to think systematically about our circumstances, a certain picture takes shape. We recognize, even if only dimly, that there are things, objects, exhibiting various characteristics and standing in various relations to one another. Our everyday understanding of the nature of these objects and their characteristics might be called into question by the sciences, but even in the sciences we find objects with particular characteristics standing in various relations. The objects might be particles, or fields, or spacetime, or something currently—or forever—unimaginable. The question is not whether there are qualitied objects, but rather, what are the qualitied objects, what are they like, where are they, and what can they do?

Thus we arrive at something like traditional categories of being: substance, property, relation. This is the point of departure, even for philosophers who go on to argue that one or more of these traditional categories is empty.

My aim in this chapter and those that follow is to advance a systematic account of substance, property, and relation that moves in the direction of narrowing the apparent gulf between the manifest and scientific images. This has always been a principal concern of metaphysics. What I have to say is in no respect revolutionary, but I hope that my way of saying it illuminates the territory, even for readers not steeped in metaphysics.

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If the reconciliation project, the project of integrating the manifest and scientific images, is to stand a chance of succeeding, it must be informed by serious ontology, metaphysics addressed to the question of what there is. Attempts at reconciliation that cherry-pick ontological theses so as to achieve some hoped-for outcome provide at best transitory satisfaction, the philosophical counterpart of a sugar high. In its favor, the ontological picture that began to emerge in Chapter 2 and is extended here endeavors to take seriously both everyday experience and the picture of the universe afforded by physics, and it does so in a way that opens the door to a straightforward, non-mysterious, solution to the reconciliation problem.

3.1 Ordinary Objects

Metaphysical reflection begins when you undertake to consider in a systematic way the nature of ordinary objects and their antics. But what are ordinary objects? The question could be understood in at least two ways. First, what are *ordinary* objects? Ordinary objects are things we treat as objects. Examples include inanimate things—grains of sand, rocks, planets—living things—tomatoes, rabbits, human beings—and artefacts—scissors, toasters, iPhones, Eddington's Table No. 1. What about electrons, fields, black holes, space itself or spacetime? These seem to be objects, just not *ordinary* objects. The boundary between ordinary objects and the rest is hazy. When it comes to ordinary objects, you know one when you see one.

You could know what ordinary objects are in this sense, however, without knowing *what* ordinary objects are. Are they (or some of them) collections of particles? Local disturbances in fields? Are ordinary objects substances in their own right, substances possessing assorted properties and standing in sundry relations to other substances? Are ordinary objects 'fundamental' constituents of reality or are they ontological lagniappe dependent on, 'grounded in', or 'realized by' more fundamental constituents? And if ordinary objects are dependent in this way, does that mean their reality is diminished relative to the things that ground or realize them? Are they first- or second-class ontological citizens? For that matter, do they exist at all? Are ordinary objects expendable constructs?

This second form of the question—*what* are ordinary objects?—is my target in this chapter. The answer will, of necessity, be somewhat abstract and tentative. This is because a detailed answer would include a significant empirical component that I, as a philosopher, am in no position to supply. What

I can provide are what C. B. Martin liked to call 'placeholders', with details to be furnished by the sciences, and in particular by physics.

Understanding the ontology of ordinary objects requires confronting the relation between the scientific image of the universe and the manifest, everyday image, reconciling, if possible, the manifest image, or a central component of that image, with the scientific image.

For most of us it is uncontroversial that ordinary objects are made up of the kinds of entity studied in physics. When you point to a rock, or a tomato, or a pair of scissors, you point to a swarm of particles, or perhaps a blotchy perturbation in a field. But of course rocks, tomatoes, and scissors have hosts of characteristics not associated with particles or fields, so it is hard to see how rocks, or tomatoes, or scissors could be identified with whatever makes them up. If a rock, or a tomato, or a pair of scissors is not a swarm of particles or a disturbance in a field, however, *what* is it?

I have said that ontology as I conceive it provides placeholders to be filled in by the sciences, especially physics. Physics is a work in progress, however. To simplify the discussion, I ask that you pretend for the moment that the universe is corpuscular, that objects, ordinary and otherwise, are, as Eddington would have it, made up of particles. You should understand talk of particles here as itself a placeholder for whatever the elements of nature turn out to be.

3.2 Propertied Substances

My ontological starting point is with substances, properties, and relations. Relations might be dispensable, but I include them here with the understanding that truthmakers for claims about relations, as noted in Chapter 2, could well turn out to be nonrelational features of the universe. Given that relational talk is unavoidable, I shall not try to avoid it.

When the topic is ontology, 'substance' and 'property' are best understood as terms of art. I accept a traditional conception of substances according to which substances are metaphysically nondependent entities that bear properties. I believe these requirements on something's counting as a substance reinforce one another, especially if you take properties, not to be universals, but modes. A mode is a modification, a way something is (Levinson 1978 speaks of properties as ways but is no friend of modes; see also Seargent 1985). A way something is, depends, both for its existence and its identity, on the something. The redness of this tomato is a way this tomato is. This very

redness—the tomato's redness—could not have been the redness of anything else, nor could it have existed had the tomato not existed.

I follow E. J. Lowe here (see e.g. Lowe 2006), who himself is following a long tradition of Scholastic and early modern philosophers, in preferring 'mode' to the currently popular 'trope'. As noted in Chapter 2, the term 'trope' as a name for particularized properties was introduced by D. C. Williams (See Williams 1953; for discussion see Campbell 1990; and Heil 2012: chapter 5). Particularized properties have had a respectable, even distinguished, history (*contra* Levinson 2006 and van Inwagen 2007) traceable at least to Aristotle's individual accidents. Aristotelian accidents, like modes, depend for their existence and identity on their substantial bearers.

The connection between accidents and substances was loosened by medievals attempting to accommodate the Eucharist, and in particular, the doctrine of transubstantiation, to an Aristotelian framework (see Heil 2015b for discussion). The idea was that, in the sacrament of the Eucharist, consecrated bread and wine were 'converted' to the body and blood of Christ. When this happened the substantial support for the accidents of the bread and wine was transformed into, hence replaced by, Christ's body and blood. The surviving accidents—the bread's whiteness and the wine's redness, for instance, minus the bread and wine—accounted for what appeared to be, but were no longer, bread and wine. These accidents did not inhere in Christ's body or blood, however; they inhered in nothing, existing apart from any substance.

Detached, free-floating accidents were dubbed 'real accidents': accidents because they are properties (but not universals), real because they could, under the right conditions, come to exist on their own, apart from any substance.

Descartes spoke for many when he observed that real accidents are accidents in name only. Real accidents, like tropes, are, it appears, 'self-exemplifying'. A red trope is presumably red, a red something, and a red something would seem to be a substance (see also Armstrong 1989: 115; Garcia 2015).

You could deny this, deny that tropes—or, for that matter, real accidents—are self-exemplifying. This would relieve you of having to say that tropes *have* qualitative natures, but then it would be obscure how conjoining red and spherical tropes could result in a red sphere.

Williams' tropes resemble real accidents in requiring no substantial bearers, but there is an important difference. A real accident must have begun life inhering in some substance. Williams' tropes, in contrast, belong to a one-category ontology. What you might ordinarily think of as an object is, for

Williams, an aggregate of 'compresent' tropes. The tropes, Williams' elements of being, are building blocks of substances, which take on an ontologically derivative status.

As explained in Chapter 2, to avoid undue confusion, I prefer 'mode' to 'trope' or 'accident'. This makes clear the dependence of properties on substances, hence the ontologically distinctive character of substances.

3.3 The Priority of Substance

Substances are property bearers, and properties are particular ways substances are. A property could not be on the scene without being the property of some substance. A substance could not exist without being some way or other. Ways a substance is are its properties. Traditional conceptions of substances make substances ontologically prior to properties. Although substance and property are correlative categories, each requiring the other, there is an important respect in which the relation is asymmetric. A substance, while it must be some way or ways, need not in every case be the particular ways it is. If properties are ways, a way requires a something for it to be a way *of*. The being of the way, its identity, is bound up with the substance of which it is a way.

Could this be right? If ways are properties, they would seem to have lives of their own, at least they would if properties are universals. If properties were universals, a single property could belong to—be 'instantiated by'—many different substances. The identity of a property would not depend on the objects possessing it.

Some philosophers, Lowe, for instance, and David Armstrong, hold that universals must have instances (see, e.g., Armstrong 1997; Lowe 2006). No universal could exist uninstantiated. In Armstrong's case, this is because states of affairs—substances having properties at times—are the ontological building blocks. God does not create the substances and the properties, the universals, then assemble them into states of affairs. Creating a universal would require creating a state of affairs that includes the universal as a constituent along with a particular, presumably a particular substance. Armstrong calls this 'the victory of particularity' (Armstrong 1997: 126–7).

Such a view gives priority to states of affairs. Substances and properties, considered in themselves, are equally abstractions, aspects of states of affairs. An alternative would be to regard properties as Platonic universals, transcendent entities capable of existence without instances. If you are a Platonist, then instantiation, the possessing of properties by objects, is a very big deal. God's

creating propertied objects (or states of affairs), is a matter of God's creating the substances and the universals, then associating universals with substances. What this kind of association would amount to is a difficult question.

Although versions of the ontology sketched in this chapter could be made to work with either species of universal, I am operating with a conception of properties as modes, fully particular ways substances are. Modes are not repeatable or shareable. A mode could not belong to more than one substance, a mode could not migrate from one substance to another. When distinct objects 'share' a property, when they are 'the same' color or shape, for instance, this is a matter of the objects' possessing similar or exactly similar modes. Tomatoes in a basket at the market could have the same color in the way members of a marching band could all be wearing the same uniform.

I have already suggested that there are powerful reasons to prefer modes to universals. I shall not pause to rehearse them, but return to the topic in Chapter 4. Very little of what I have to say here requires that properties be modes, although I admit that thinking of properties in this way helps to motivate the broader ontological picture. Pressing the point, however, would serve only as a distraction from the topic under consideration: substances and ordinary objects.

It might seem that we are there already. An ontology that includes substances and ways those substances are, properties, could simply identify objects with propertied substances. A tomato, an ordinary object, is various ways, possesses various properties. The tomato is red, spherical, and pungent. So the tomato would seem to belong to the category of substance and its characteristics to be properties.

Although substances are objects, not everything we call an object, and probably nothing we take to be an ordinary object, is a substance. This is because substances must be simple and, assuming a corpuscular universe, few, if any, ordinary objects are simple.

3.4 Substantial and Non-Substantial Parts

By 'simple' I mean: lacking parts that are themselves substances. The parts in question, parts in the everyday sense, are 'proper parts'. A proper part is a part that is less than the whole of which it is a part: the whole includes additional parts.

A simple substance need not be an extensionless point, however. Space itself might be a candidate simple substance. Space can be endlessly divided into

regions, but these regions are not substantial parts of space, space is not made up of spatial regions in the way a floor is made up of tiles. You might start with the idea that complex wholes depend on their substantial parts, the parts that make them up. But space does not depend on its spatial parts. On the contrary, parts of space depend on it.

This will be so for the spatial parts of any spatially extended thing. The left half of a tomato depends on the tomato in its full spatial extent. You need a whole tomato to have these halves. This is simply a consequence of the fact that parts, or regions of space, depend on space as a whole. Space is not assembled from its spatial parts. The parts are divisions of space. And, if time is spacelike, what goes for spatial parts would go for temporal parts.

One common but avoidable mistake is to confuse the spatial parts of something, the left half of a tomato, for instance, with the matter that occupies the region the spatial part encompasses. Indeed it is natural to refer to parts of material things by citing the spatial region they occupy. The matter making up the left half of a tomato, the matter occupying a spatial region of the tomato taken as a whole, is perhaps a collection of particles, substances in their own right. If you slice a tomato in two and give me the left half, you are giving me a portion of the tomato that once occupied the tomato's left half.

Many philosophers who speak of objects' spatial and temporal parts mean something different. For them your right and left hands are distinct spatial parts of you. Analogously, temporal parts are regarded as parts of you that, over time, add up to you. One consequence of this conception of temporal parts is that you, the whole of you, is never fully on the scene. This is regarded by opponents of temporal parts as patently unacceptable. Surely you sitting down to breakfast, and you at bedtime are wholly present on both occasions!

I am thinking of temporal parts differently. A temporal part of you is not a component part of you that, taken together with other temporal parts, add up to you, but you, the whole you, at or during a given time. Temporal parts, like spatial parts, and unlike mereological parts, depend on the wholes, the sequences, to which they belong.

3.5 Substantial Simplicity

In saying that substances must be simple, then, I mean only that a substance cannot be made up of substantial parts. But why think that? Granted, a heap of tomatoes at the supermarket would not count as a substance, but an individual tomato would appear to be an object, a substance with properties, and a

tomato seems clearly to be a complex entity with parts that themselves have parts. So why doubt that complex entities are, or could be, substances possessing properties?

Two reasons deserve mention. First, as noted already, on a traditional conception of substance, a substance is a metaphysically nondependent entity. A complex substance would be something made up of parts that are themselves substances. Arguably, a complex made up of substantial parts depends at any moment at which it exists on those parts.

Spatial parts aside, the idea that complex objects, objects made up of substantial parts, depend on those parts, might be questioned on the grounds that complex objects can survive the loss or replacement of parts. Consider an ancient philosophical example, a ship made up of planks, and pretend the planks are substantial parts of the ship. Does the ship depend on the planks?

Apparently not: you could remove a plank and replace it without the ship's ceasing to exist. If the ship's planks were removed and replaced one at a time, the planks could eventually all be replaced without compromising the existence of the ship. You might think that, were that to happen, the ship—the selfsame ship—would continue to exist. In fact a number of the ship's parts could be removed and not replaced at all without jeopardizing the ship's existence. How then could the ship be thought to depend on its substantial parts?

A particular complex object such as a ship, or a tomato, or a rabbit is, at every moment of its existence, made up of a particular collection of substantial parts, duly organized. The complex making up the ship at a given time is just those parts (again, duly organized, a qualification henceforth assumed). If you change the parts, you change the complex.

What exactly is the relation between the ship and the complex that now makes it up? One possibility is that, at any given time, the complex *is* a ship if it, the complex, has what it takes to be a ship, if the complex is an instance of shiphood. Whether a successor complex counts as the same ship depends on whether it has what it takes to be the same ship, whether it is an instance of what it is to be the same ship.

The suggestion is not that talk of ships, or complex objects generally, is analyzable into talk of their substantial parts, or that complex objects are 'reducible' to the parts that make them up. A complex is a particular collection of parts arranged in a particular way. If you change or rearrange the parts, you change the complex. A complex depends for its identity at any given time on the parts that make it up at that time. This much is relatively uncontroversial. Philosophically innocent readers might be surprised to learn that, among

philosophers, it is indeed controversial whether the complex making up the ship at a given time is itself a ship, whether it, the complex, is an instance of what it takes to be a ship.

Someone might grant that the complex depends on its parts and thereby falls short of substancehood, but insist that the ship—or, if not the ship, some other complex entity, a rabbit, a tomato—does not depend on its parts, hence could qualify as a substance. This strikes me as an exceedingly odd position. The complex, here and now, *is* the ship by virtue of having what it takes to be a ship. This will be so for any moment of the ship's existence. The complexes might change, but whenever there is a ship there is a complex having what it takes to be a ship.

To be sure, the ship's being, or continuing to be, a ship or the same ship, might not depend on one or another of its parts. Identity and persistence conditions for complexes differ from those for ships. Nevertheless, any concrete instance of shiphood is a complex that is the complex it is because it has the parts it has arranged as they are. The only way to get a ship on the scene is to get the right sort of complex on the scene. If you are ontologically serious about substances, and if you accept both that substances are nondependent entities and that complexes depend on their substantial parts, then you will not accept that a complex's having what it takes to be an object of a particular kind confers substancehood upon that complex.

I am assuming that there is something it is or would be to be a ship: a ship is a something that has what it takes to be a ship. When you know what it is to be a ship, you have a grasp of an essence, a topic to which I return in Chapter 4. For the time being, I mean only to be echoing a point made in Chapter 2: essences, as I understand them, are not themselves entities, not constituents of objects, not in any sense responsible for bringing it about that an object is the kind of object it is. To grasp an essence of an entity, ϕ, is to have an understanding of what it is or would be to be a ϕ.

Although essences are often said to be expressible by means of 'real definitions', essences themselves are in no sense conventional, in no sense language- or mind-dependent.

Is the position I am suggesting metaphysically extreme? I do not think so. It in no way threatens or disparages ordinary objects: rabbits, tomatoes, ships. To deny that ordinary objects are substances is not to disenfranchise or 'eliminate' ordinary objects, it is to shed light on what they are: their ontology. The mistake would be to try reading the ontology directly off the terms we use to demarcate ordinary objects.

3.6 Substances as Property Bearers

So far, I have barracked for the thesis that, if substances are nondependent entities, they must be simple. Because complex objects at every point in their careers depend on the parts that make them up, they fail to qualify as substances. Think of ordinary objects such as ships, rabbits, and tomatoes as dynamic arrangements of substances that satisfy ordinary identity and persistence conditions for rabbits, ships, and tomatoes by virtue of having what it takes to be rabbits, ships, and tomatoes.

These remarks are not offered as a decisive argument. The aim, rather, has been to set out considerations in favor of an ontology that might eventually equip us to understand the relation between the manifest and scientific images, the relation the appearances bear to reality. This, as noted in Chapter 1, is the most that can be hoped for in metaphysics. In the meantime, I invite you to consider a second reason to think that substances must be simple, a reason stemming from the relatively anodyne thesis that substances are property bearers, coupled with a conception of properties as modes, particular ways particular substances are.

The thought here is straightforward. A mode is a modification of a substance. You can see how this works in the case of a simple substance. Pretend for a moment that a billiard ball is a substance. The ball's sphericality is a modification of the ball, a way the ball is. Now consider a complex, a ship, for instance, something with substantial parts, something made up of substances. A property of this complex would be a way the complex is, a modification of the complex. But what would it be to be a modification of the complex, what would it be to be a way the complex is?

There appear to be two possibilities, neither of which takes you to properties of complexes. First, a way a complex is might be ways its individual parts are. What makes it true that a particular ship has the mass it has might be that its parts' masses add up to the ship's mass. The ship's mass just *is* the combined masses of its parts.

Second, a way a complex is might be the way its constituent parts are organized. A shipwright gives a particular shape to a ship by organizing—joining together—its parts in a particular manner. You could think of this organization as something 'in addition to' the parts, but that would not be to say that the organization is in any sense a modification or property of the complex. The complex comprises these parts thusly organized.

The fact, an important fact, that the parts of complexes can interact and influence or change one another in all sorts of ways does not affect this point.

What it is to be an H_2O molecule is not simply to have the right kinds of constituent atom in close proximity, but to have these interacting, and affecting one another in the process. A tomato is not simply a 'tomato-shaped collection of particles', but a dynamic, highly organized, massively interactive collection of particles apparently held together by physical forces. If properties are modes, and modes are ways substances are, ways complexes are would be ways they are organized, typically interactively organized. But again, a way a complex is organized is not a mode, not a property of the complex in addition to properties of its parts and their arrangement.

A property of a complex would have to inhere, not simply in its substantial parts, but in the arrangement of those parts, and arrangements do not present themselves as apt bearers of properties. A property of a complex would, as Leibniz puts it in the case of relations, have a 'leg' in many substances at once, existing somehow 'between' them (Leibniz 1715: Fifth Paper, § 147).

The unsavory nature of properties of complexes is largely invisible because of a tendency to regard predicates that apply truly to objects as thereby denoting properties of those objects (Heil 2003 obsesses over this point). Clearly, endless predicates hold true of complexes that do not hold true of their constituent parts, but it does not follow that these predicates designate properties of the complexes. Truthmakers for applications of the predicates are not properties of complexes but the complexes' being as they are: duly organized, interactive, dynamic collections of individual substances.

You will be unmoved by this line of reasoning if you are a Platonist about properties. In that case, however, your conception of substances—as particulars owing their character to relations they bear to entities existing 'outside' spacetime—differs dramatically from the one on the table. You will be unmoved as well if you think of properties of wholes as 'emerging' once the parts are interactively organized, a possibility to which I shall return in Chapter 8.

3.7 Complex Objects

What if ordinary objects were not substances, not property bearers? In that case would ordinary objects really exist? Even if they did, would ordinary objects be iffy, less-than-fundamental constituents of the universe grounded perhaps in more fundamental entities?

I have offered assurances that the ontology I am recommending does not jeopardize or diminish the standing of ordinary objects. Rather, it reveals

something of what ordinary objects might be, it reveals something about their individual natures, subject always to empirical correction. By virtue of being complexes made up of substantial parts, ordinary objects are dependent entities, entities depending at every moment of their histories on substances that make them up. They are not on that account second-class existents. If the particles are real, their arrangements are no less real. You could not have the particles without having arrangements of particles.

You might agree up to a point, but think that, even so, some objects, some arrangements must be *more* real than others. Compare the tomato to a made up philosophers' object comprising the tomato, de Gaulle's nose, and three coins residing in the Trevi Fountain in 1954. 'Objects' of this kind appear to be philosophical monstrosities, pretenders, arbitrary collections lacking in the kind of unity associated with bona fide objects.

But again: if the parts are real, their arrangements are no less real. Contrived philosophers' objects are as real as tomatoes, which are as real as the particles making them up. What the tomato has that the philosophers' objects lack is a vast dynamic network of connections and interrelations among its parts. This is what holds the tomato together (despite incessant comings and goings of individual particles) and what enables the tomato to retain its interest: the arrangement is one we care much more about than we care about philosophers' objects. We dignify arrangements we favor with labels: arrangements of *this* kind are tomatoes.

The state of the universe and the causal histories of arrangements having what it takes to be tomatoes ensure that there are lots of tomatoes. There are, right enough, innumerable arrangements that exhibit a measure of stability but that we care nothing about, so never notice. Tomatoes attract our attention, philosophers' objects do not. But considered as constituents of the universe, all these arrangements are perfectly upstanding, all are on a par ontologically. They differ intrinsically in myriad ways. Tomatoes are complex affairs, not simply by virtue of having many parts, but by virtue of the many chemical, electromagnetic, gravitational, and other interrelations among their parts. The tomato's relative unity is physical, not metaphysical.

To reject metaphysical principles of unity is to reject the idea that, when it comes to ordinary objects, there is a univocal answer to Peter van Inwagen's 'special composition question': under what conditions do objects combine to constitute another object (van Inwagen 1990)? By this I mean that there is no univocal answer that would distinguish among kinds of complexes in a way

that would reflect scientific and ordinary categories of object, distinguishing these from non-objects: no principled way to separate the sheep from the goats. Ontologically, every complex is on a par.

Complex objects, philosophers' objects, for instance, can be made up of parts entirely loose and separate. Other objects are made up of dynamic collections of parts held together by natural forces. The latter include inanimate objects, such as rocks and planets, artefacts—tables and scissors—and living things—tomatoes and rabbits. The story of what holds these collections together, what accounts for their stability in the face of the hithering and thithering of insensible parts, is what you find in the physical sciences, ultimately what you find in physics.

The mistake is to accord some favored class of object an elite ontological status. In a pluralistic universe there are the particles arranged as they are, interacting and affecting one another as they do. The arrangements are no less respectable than the particles that make them up. We single out particular kinds of arrangement for special attention and label them. The labels are mind-dependent, but not the divisions they remark.

Metaphysics, and in particular, ontology, is sometimes described as an attempt to (as Plato put it) 'carve the beast of reality at the joints' (*Phaedrus* 265d–266a). But reality has endless joints, most of which escape notice. The idea that some of these are ontologically privileged, some are real or more real than others is specious. The time has come to move on.

3.8 Vagueness

Thus far I have said nothing about two problems that concern philosophers who have thought long and hard about the metaphysics of complex objects: the problem of vagueness and the possibility of 'coinciding' objects. I shall address these in order.

My conception of vagueness emerged from discussions with John Bigelow and with Roy Sorensen (see especially Sorensen's 1985 proof that 'vague' is vague), who did their best to educate me on the topic (with only limited success).

If a tomato is a collection of particles (duly interactively organized), which collection is it? Even if you ignore the possibility that the collection is constantly gaining and losing particles, many candidate collections would seem to fit the bill. Which one is the tomato? Presumably the tomato includes—or is accompanied by?—a penumbra of particles. Which of these belong to the

tomato, which do not? Or is this just a matter of arbitrary decision? Genetic engineering aside, are tomatoes human inventions?

If the universe consists of particles interacting in space, every particle is what it is and is related to every other particle in whatever ways particles are related. No vagueness there. Some particles exert forces on other particles so as to form dense collections, hydrogen atoms, for instance, or H_2O molecules. Other collections are less compact grading off into penumbrae of particles, penumbrae that might extend as far as you like. Some particles, including those belonging to moderately compact collections of particles (and their penumbrae) are spatially or temporally remote from other particles, perhaps outside their light cones. Still no vagueness.

In the context of a universe of particles, thoughts of vagueness are tied to complexes of particles. Where do these begin or end? Is there a fact of the matter, or is it our call, something for us to decide? If there is a fact of the matter is the fact knowable? Is there vagueness 'out there', is there 'ontic vagueness' or is vagueness in us, either because it is up to us to draw the appropriate boundaries, or because we are ill-equipped to discover the real boundaries? I believe that such questions are wrong-headed. They misjudge the relation our thoughts about the universe bear to the universe.

Consider a particular tomato. Is it vague what the tomato is? Assuming the tomato is in fact a dynamic interactive collection of particles complete with penumbra, where are its boundaries? Which collection is the right collection? Or is this just up to us?

The state of the particles, all of them, over time is not vague: it is what it is. But what about the tomato? Is it vague what the tomato is? Is 'tomato' a vague predicate?

Suppose ordinary objects such as tomatoes are collections segueing into penumbrae. When you pick up a tomato, what you hold in your hand is a pulsating interactive collection. Collections are dependent entities, entities dependent at every moment of their histories on particles that make them up. I have insisted that this does not make them marginal existents, however. If the particles are real, their arrangements are no less real. If you have the particles, you have arrangements of particles.

What of the original question, if a tomato is an interactive collection of particles, *which* collection is it? Even if you disregard the possibility that a particular collection is constantly gaining and losing members, many candidate collections would seem apt. Which one is the tomato? Any candidate tomato is accompanied by a gaggle of particle hangers-on. Which of these belong to the tomato, which do not?

Suppose that what you point to when you point to a particular tomato is a buzzing swarm of particles complete with a fringe of particles of variable denseness. Well, when you point to the tomato this—this seething, dynamic swarm—is what you point to, this is what you select from a display at the supermarket, take home, wash, slice, and consume in a salad. The dismal track record of attempts to provide a principled answer to the question, which, if any, of the candidate collections is (or constitutes) the tomato, has no bearing on your give and take, linguistic and otherwise, with the tomato.

If 'tomato' is vague, this is not because collections answering to 'tomato' lack definite boundaries, but because our deployment of 'tomato' relies on similarities, and similarity, while objective, is nontransitive, similarity can come in degrees, and, in the case of substances and complexes, admits of 'respects'.

A can be similar to *B*, and *B* to *C*, without *A*'s being similar to *C*. Objects can be similar in some respects, not in others. Electrons and positrons are similar with respect to their masses, but dissimilar with respect to their charges. Similarities and dissimilarities among objects are indirect, stemming from similarities and dissimilarities among their properties (their 'respects'), which are similar or dissimilar *tout court*.

In the case of particles and their properties, exact similarities might be the rule, but when you move to complexes, similarities inevitably flow into dissimilarities. To the extent that everyday and special scientific taxonomies mark off similarities, these taxonomies will fail to align with those of physics, and the boundaries they circumscribe will be indistinct. Far from being a defect, however, this lack of definiteness serves them well in their intended domains.

The moral would be the same were it to turn out that the universe was not a universe of particles, were the universe, for instance, one in which tomatoes were dappled concentrations of energy in a field extending their reach throughout the field. The concentration would be what it is, and 'tomato' would be as serviceable as ever.

When you go to the supermarket to buy tomatoes, you do not struggle to separate tomatoes from one another or from avocados. 'Tomato' was never meant to circumscribe pristine physical or metaphysical boundaries, never meant to comport with the physics of tomatoes, but only to facilitate everyday transactions with salient aspects of the universe we are pleased to call tomatoes. There are certainly reasons why some collections of particles remain relatively stable and unified over time, why they are salient, why they behave as they do, but these reasons concern physical forces and processes, not Aristotelian substantial forms, not metaphysical agents of unity.

Vagueness as a distinctively philosophical problem comes on the scene when you begin thinking about *kinds* of entity: molecules, tomatoes, heaps. Talk of kinds calls to mind repeatable, or at any rate, closely resembling entities. In the case of particles and tightly-knit atomic structures, resemblance across instances would be common. Although I stand to be corrected, it would seem that hydrogen atoms exactly resemble one another as do H_2O molecules. Now return to the idea that any entity, simple or complex, is what it is, and suppose that kinds of entity are of the kinds they are because they have what it takes to be entities of those kinds. H_2O molecules, for instance, are H_2O molecules because they have what it takes to be H_2O molecules.

Bishop Butler observed that 'every thing is what it is and not another thing' (Butler 1729: xxix). He might have gone on to add that, not only is every thing the very thing it is, but every thing is the kind of thing it is, every thing has what it takes to be whatever kind of thing it is. And again, how could it be otherwise?

Presumably complexes that have what it takes to be hydrogen atoms or H_2O molecules are plentiful. What about tomatoes? Everything without exception—simple, complex, gerrymandered—is what it is and has what it takes to be the kind of entity it is. If that is so, however, differences among entities, however small, would mark differences in kind. Unlike hydrogen atoms or H_2O molecules, two complexes answering to 'tomato' are most unlikely to be complexes of precisely the same kind. (I return to this point in Chapter 4.)

Does this make tomatoes vague objects? Is there an epistemically elusive truth concerning where tomatoes begin and end?

Whatever you pick up from the tomato display at the supermarket is what it is and not another thing. 'Tomato' functions nicely to distinguish what you are picking up from other things in the vicinity and manages to do so because the myriad kinds answering to 'tomato' are similar in obvious ways. There is much we do not know about the collections answering to 'tomato', but this merely reflects the banal fact that there is much about the universe concerning which we are ignorant, not some elusive truth about where collections leave off or what it takes, precisely, for a collection to achieve the status of genuine tomatohood.

I hope it is obvious that this is not in any way to sell tomatoes short, it is in no respect an antirealism about tomatoes. Barring an Evil Genius, it is true that, as I write these words, there are tomatoes. I am simply making it clear how you might go about ascertaining the nature of the truthmakers for truths about tomatoes.

To imagine that tomatoes and their ilk could be tightly circumscribed is to misjudge the place occupied by tomatoes in the manifest image, the image that guides us in our everyday and scientific commerce with the universe. Tomatoes are just fine. There is no special ontological or epistemological problem to be solved about where tomatoes begin and end or whether there was or was not a first tomato. Some collections fit the bill, some do not, and in some cases, reasonable people could disagree.

Once all is said and done, every thing is what it is and not another thing.

3.9 Coinciding Objects

Even if I am right about vagueness, what of apparently coinciding objects: the statue of Stan Musial and the lump of bronze making it up? The Musial statue is, like most statues, not really a lump but a hollow shell. Philosophers have traditionally spoken of statues and the lumps that make them up, however, and I follow suit here to honor tradition.

Statues and lumps exhibit distinct identity and persistence conditions. This is just to say that what it takes to be a lump (or the same lump over time) and what it takes to be a statue (or the same statue over time) differ. The statue can gain or lose parts: the statue's ear could be replaced, for instance, without annihilating the statue. Not so the lump. The lump is a portion of bronze. If you add to or subtract from the lump, you have a new lump.

You might want to challenge this last thought on the grounds that, at the particle level, the lump is likely gaining and losing particles at every moment. In order to avoid irrelevant complications, however, I propose to continue following custom and pretend this is not so.

The statue and the lump are sometimes said to be distinct, but coinciding, objects because they differ in their properties. Leibniz's principle of the 'indiscernibility of identicals' tells us that if *A* is *B*, then every property of *A* is a property of *B*, and vice versa. The lump was around before it was moulded into a statue, however, and, if the statue is melted into an ingot, the lump survives the statue's demise. The lump and the statue have distinct histories, distinct 'historical properties'.

Even if the lump and the statue did not differ in their respective histories, however, even if they came into existence and went out of existence at the same moment, they would apparently differ in other respects. The statue and the lump differ in their 'modal properties', they differ, for instance, in what sorts of change they could or could not undergo. The statue, but not the lump,

could survive the replacement of the statue's ear. On the other side, the lump, but not the statue, could survive being melted down and recast as a statue of Rogers Hornsby.

One mistake here is to regard historical and modal predicates true of objects as being true because they correspond to properties of those objects. The lump—indeed the swarm of particles making up the lump—has a history, some portion of which coincides with the history of the statue. These histories are not usefully thought of as properties of the lump and the statue.

You could accept this much, even if you did not suppose as I do that properties are ways substances are and substances must be simple. Think of the particles that make up the lump. These have trajectories through space and time that lead them for a period collectively to have what it takes to be a lump, and then, for a period, to have what it takes to be a statue as well. These circumstances provide truthmakers for assertions about the respective histories of the lump and the statue.

Talk of modal properties is simply a misleading way of talking about what it takes to be, what would count as, a lump, a portion of bronze, or a statue. Learning what lumps and statues are is to learn identity and persistence conditions for such things, to learn what changes a lump or a statue could or could not undergo while still having what it takes to be the same lump or the same statue.

In saying, for instance, that a lump could not gain or lose parts, you are not saying that there is some feature of the lump that intercedes, preventing it from gaining or losing parts, some special metaphysical bond that simultaneously holds the lump together and resists the addition or subtraction of parts. Similarly, in saying that a statue could not change its shape, at least not dramatically, you are not saying that statues are unnaturally rigid and resistant to changes in shape.

A lump cannot gain or lose parts because a lump that gained or lost parts (within limits) would not count as the same lump, a fact reflected in the application conditions for the lump predicate—or, if you like, the lump concept. Similarly, it is true to say that a statue could survive replacement of its parts, but not a dramatic change of shape because, as application conditions for the statue predicate make clear, a statue that underwent such changes would not count as the same statue. Modal predicates of the kind under discussion express what our scholastic forebears called 'extrinsic denominations'.

We grasp identity and persistence conditions for complex objects such as lumps, statues, and tomatoes in the course of grasping what it is or would be to

be a lump, a statue, or a tomato. This is reflected in our cognitive and linguistic practices. These practices are not handed down *ex cathedra*, however. They are honed in the course of our ongoing give and take with the universe. They enable us to mark out salient features of our surroundings in ways that align with our assorted purposes, but they do not create those features.

3.10 Properties and Powers

Why do objects behave as they do? One natural thought is that objects behave as they do because they are as they are, or, more accurately, because they are as they are in the circumstances they are in. Near the surface of the Earth, a tomato rolls, or would roll, owing to its sphericality, it depresses a scale owing to its mass, where the tomato's sphericality and mass are regarded as properties of the tomato. So it would appear that an object's behavior—actual and potential—is affected by ways it is, its properties.

Some philosophers believe that objects' properties play only an indirect role in determining what they do or would do. Really, they think, the truth is that objects are governed by contingent laws of nature that see to it that spherical things roll and things with mass depress scales. The very same objects would behave very differently were the laws of nature different.

But what are laws, and what is it for a law to govern an object's behavior? You might regard this as a frivolous, even perverse, question. There are laws and laws govern; end of story. The sciences are in the business of spelling out the laws and invoking them in the course of explaining why things do what they do. Who are philosophers to poke their noses into entrenched scientific practice?

Agreed. There are laws. The question remains, what *are* laws, or better, what are the truthmakers for statements of laws, and what is it for a law to govern?

In the seventeenth century, Descartes was among those who promoted the thought that material bodies were themselves impotent: a material body could communicate, but not initiate, motion. Ultimately, the behavior of material bodies was controlled by external factors, most prominently God's interventions, and perhaps, to a lesser extent, interventions of finite agents. God does not act capriciously, however. God acts for the best and does so in principled ways. The task of the scientist, the natural philosopher, is to discern God's intentions by framing mathematical hypotheses and fitting these to observations of the motions of material bodies. Laws of nature express principles on which God acts.

Such a conception of laws allows for a clear understanding of what it would be for objects to be governed by laws. But what happens when you subtract God from this picture, as Hume does? In that case laws no longer govern. At most they express generalizations reflecting widespread patterns of covariation.

What a strange view! Sadly, we philosophers have become accustomed to it, inured to its strangeness. But why should we follow Descartes and Hume in supposing that objects are impotent? Descartes was intent on purging physics of longstanding Aristotelian influences. Aristotelians explained natural processes by supposing that objects possessed powers to act in concert with other objects en route to pursuing their inherent natural ends.

On one reading of Aristotle, living things embodied substantial forms, which unified them and governed their functioning. Organisms, for instance, have purposes by virtue of being the kinds of organism they are, and they are fashioned into the kinds of organism they are by their respective substantial forms. (I leave it open whether this is a plausible account of Aristotle's considered view. I have more to say about substantial forms in later chapters, especially Chapter 9.)

Descartes, and many of his contemporaries, rejected substantial forms. The explanation for the functioning of organisms was wholly non-teleological, non-purposive, purely and unrelentingly mechanical. Consider an integral part of you, your spleen. For Descartes, the idea that your spleen does what it does because this is what spleens are meant to do involves a kind of mistake, a projection of what we regard as normal, or desirable, or adaptive onto what is really a material system operating in accord with natural laws implemented by God.

Describing a spleen as defective or as malfunctioning, would be, for Descartes another instance of extrinsic denomination. Considered just as a material system, a human body that includes a malfunctioning spleen would be behaving exactly as it must behave given the laws of nature. What else could it do!

In the 6th *Meditation* Descartes illustrates the point by reference to an artefact (Descartes 1641: 58–9). A poorly designed clock or a clock with grit in its gears fails to keep time correctly. We say that the clock is malfunctioning, that the clock is not doing what it is supposed to do. But really the clock's mechanism considered simply as a material system of gears, springs, weights, with the addition of grit is doing just what it is obliged to do given its material makeup and the laws. Describing the clock as malfunctioning is simply to indicate that the clock is not doing what we would prefer it to do or what its

manufacturer intended it to do. The idea is not that it is false that a clock or a spleen malfunctions, but that such judgments involve attitudes of agents: finite creatures or God.

It is one thing to dismiss Aristotelian substantial forms and teleological models of explanation in physics, however, and another matter altogether to reject the idea that objects behave as they do because they are as they are. Descartes' physics is purely kinematic, purely geometrical, but, once you introduce forces into the picture, the idea that objects are passive and impotent loses steam. Objects attract one another owing to their masses. It looks as though mass is best understood as empowering massive objects to interact in familiar ways. The same could be said for charge. An electron repels other electrons, attracts positrons, and establishes connections with protons owing to its charge. A tomato rolls or would roll by virtue of being spherical and would depress a scale by virtue of having a particular mass.

Suppose that properties, or some properties, empower their possessors. Where does this leave laws of nature? You might think of laws as equations, formulae, principles, not entities regulating the behavior of objects. Laws represent attempts on the part of scientists to codify the contribution particular kinds of property make to what their possessors do or would do. Newton's laws, for instance, could be seen as attempts to distill the contribution mass makes to the behavior of anything having mass. Of course things with mass have other characteristics as well, and these can contribute in their own ways to the actual behavior of their possessors. An arrow and a ball of yarn of equal masses launched at equal initial velocities near the surface of the Earth would behave differently owing to differences in their densities and shapes.

3.11 Properties of Complex Objects

We are back with the idea that objects do what they do because they are as they are. Objects are various ways, and these ways determine how they interact with other objects. This is to regard properties, or at least some properties, as empowering or dispositional. But how does all this comport with an ontology of simple substances?

According to that ontology, substances, bearers of properties, must be simple, lacking parts that are themselves substances. Ordinary objects, objects populating the manifest image, are, I have asked you to pretend, complex entities made up of many substances. These complexes are not substances,

hence they do not themselves possess properties in addition to the properties possessed by their parts. Does this mean that complex objects are impotent?

I have deployed tomatoes, balls of yarn, and arrows as examples of objects that behave as they do owing to their properties. Such things have shapes for instance. But the respective shapes of the tomato and the arrow are not in fact properties—or they are, if you like, properties-by-courtesy, *quasi*-properties, what I have elsewhere dubbed Episcopalian properties (Heil 2012: 152). So how could these 'make a difference' in what an arrow or tomato does or would do?

As I have stressed, to deny that tomatoes or arrows are substances is not to deny that they exist. It is to say that they are complexes made up of propertied substances standing in all sorts of dynamic relations to one another and to substances elsewhere. Similarly, to say that the respective shapes of the tomato or the arrow are not properties in the strict sense is not to cast doubt on their significance. The shapes are what you get when you organize these constituents in these ways.

Just as you do not have the particles duly organized and, additionally, the tomato, so you do not have the organized propertied particles plus the tomato's sphericality. To deny this is to engage in a kind of illicit double counting. 'How many things are in your pocket?' 'Four: two pennies, a button, and their sum.' The problem here is not that the sum does not exist, but that it is not a fourth thing, something in addition to the pennies and the button.

Just as it makes perfect sense to regard ordinary objects such as the tomato as substances, provided this is not understood as a matter of referring to an entity in addition to the dynamic arrangement of interacting substances that make up the tomato, so it is perfectly unobjectionable to speak of the tomato's properties, hence its powers, provided this is not understood as referring to further properties of such an entity, ways it is distinct from the ways its propertied parts are dynamically and interactively organized. When you look closely at the tomato, you see that its properties and powers, are tied to the particles, their properties, and their interrelations. This does not undermine the standing of tomatoes, does not threaten eliminativism or nihilism about tomatoes; it illuminates their individual natures.

Some readers will be unhappy with the line I am taking on properties of complex wholes on the grounds that it excludes 'emergent' properties. I cannot provide a clear statement of what an emergent property is, but the idea roughly is that some characteristics of complex wholes are indeed additional, 'over and above' characteristics of the parts interactively arranged. When you have the parts and their properties interactively organized into a whole, you have, on

top of these, properties of the wholes. Often proponents of emergence hold, in addition, that emergent properties exert a 'downward' causal influence on the parts of complexes in which they emerge, a position sometimes associated with Aristotelian hylomorphism.

I propose to address hylomorphism thus conceived, and emergence and downward causation in Chapters 8 and 9. Meanwhile I shall conclude this chapter with a consideration of the plausibility of an ontology of substance and property in a continuous, non-corpuscular universe.

3.12 Objects as Modes

Thus far, I have been following established philosophical custom, pretending that the universe comprises particles moving about and interacting in space over time, while acknowledging that, for all we know, matters could be quite different. Perhaps what we think of as particles are really disturbances in fields, or dynamic wavelike eddies in space itself or streaks in spacetime.

Notice, first, that if any of these options obtained, they would be perfectly compatible with a substance–property ontology. More than that, they would provide empirical support for the thought that substances here and now are simple, lacking in parts that are themselves substances. The substances could be the fields, or, if the fields are ultimately unified, The Field, or there might be just one substance space itself, or spacetime, or, as with Spinoza, the universe as a whole.

What happens when you move from a conception of the universe as corpuscular, a universe comprising countless simple substances, to the idea that there is but one substance, space itself, for instance? In that case what we commonly regard as objects could turn out to be local spatial thickenings or eddy-like disturbances, abstract particulars in a traditional sense. These would be ways space is, modes, modifications, properties of a substance, not themselves substances.

This is how Spinoza saw it, and it is very possibly Descartes' view of material bodies as well. Others, including Locke and Newton, found much to be admired in the idea that bodies were not lumps of matter moving about in a container space, but modes of a single extended substance (see Bennett and Remnant 1978). All parties appreciated its implications for the status of ordinary objects.

Return to the tomato. Given the view under consideration, a tomato would be neither a substance nor a dynamic arrangement of substances. It would be a

local, relatively compact modification of space, a mode. What of the tomato's properties, its sphericality, its mass? Would these be higher-order properties, modifications of modes? If a mode is a way a substance is, a mode of a mode would be a way that mode is. But a way a mode is would be the mode itself: a way a way is is just an aspect of the way. A tomato would resemble a bruise and the tomato's sphericality the region occupied by the bruise.

I have moved from the thought that there might be a single substance, space, for instance, to talk of ordinary objects as local modifications of space. This suggests an abandonment of the particles. Particles could survive, however, not as substances, but as modes. The move from a pluralistic universe of many substances to a monolithic one-substance universe deprives the particles of their status as substances, but need not thereby deprive them of existence.

An alternative would be a universe comprising spacetime plus various fields, something in the vicinity of the kind of universe described by Campbell (1990: chapters 5 and 6). In such a universe the substances would be the fields, and causal relations could perhaps occur between, but not within, fields, a thought I shall revisit in due course.

One interesting question concerns the status of causation, that is, efficient causation, causation as we ordinarily think of it, in such a universe. If objects, including particles, are at bottom modes, in what sense could they be said to interact causally? Could modes affect or bring about other modes?

Although endeavoring to answer this question would take the discussion into very deep waters, it has the potential to reveal much about the relation the manifest image bears to the scientific image. Before taking the plunge, however, I propose to address some of the topics that have to this point made only cameo appearances. My hope is that the intervening discussion will make my conclusions concerning efficient causation and the manifest and scientific images spelled out in later chapters seem all but inevitable.

4
Essences, Kinds, Universals

> We have in daily life a job lot of useful tacit rules about what extra patterning of position and resemblance, on top of the bare partitive relations, suffices to distinguish 'real things', or 'wholes', like an atom, an ax, a cabbage, a man, from 'mere sums'. The former are solid, they contrast with the milieu, they hang together while they move, and so forth. But the idea is vague. Whether we consider an axhead and handle as two things or as one or a billion seems a changing function of changing purposes. Most of us think that in no case, and even the Aristotelian that only in a few cases, is there an inner principle which determines whether we have carved where the true joints are, while even the Aristotelian who does think that there are metaphysical 'substantial forms' can say little more of them than that they are what makes true individuals.
>
> D. C. Williams 1959b: 219–20; 1966: 255

4.0 Old Dog, New Trick

For most of my philosophical life I have managed to repress thoughts of essences, regarding them with the kind of dark suspicion that naturally attends thoughts of conspiracy theories found on the internet. More recently, I have been moved to reassess my previous concerns. In what follows I shall say something about one way of thinking about essences, and about kinds and universals, although I make no attempt to cover the territory exhaustively. (See papers by Fine beginning with his 1994; Lowe 2006; Koslicki 2012; Oderberg 2007, for four representative discussions of essences.)

I can say at the outset that I regard essences, at any rate essences as I conceive them, as inevitable: whatever is, is what it is essentially. The reasons for this inevitability, however, ensure that essences are ill-suited to perform heavy-duty explanatory work in metaphysics. Philosophers who spend time advancing accounts of essences (including the four authors cited above) would be unlikely to approve of what I have to say about essences. Maybe other

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conceptions of essences do offer an explanatory payoff. Although I am sceptical that we have any very good reason to accept these alternative conceptions, this is not a point I intend to press in this chapter. Sometimes offense is the best defense.

4.1 A Corpuscular Universe

Much of what I have to say here about essences, kinds, and universals was prefigured in earlier chapters. My hope is that the discussion to follow will begin to bring some of what was said there into focus, or at least make it seem less outrageous, if not downright winning.

The starting point is by now familiar: an ontology of substances, properties, and relations, with the proviso that truthmakers for claims about relations could be, and probably are, nonrelational features of the universe. Substances are simple, lacking in substantial parts, parts that are themselves substances. Properties are particular ways the substances are, modes.

One job of physics is to tell us what the substances and their properties are. The substances could be particles distributed in space, they could be fields or a single unified field, there could be a single substance, spacetime, or the universe itself. The 'could' here is epistemological. Whether there really are or could be particles or fields would be dictated by factors to which philosophers lack immediate access.

To keep the discussion from becoming hopelessly abstract, I shall begin by asking you once again to suppose that the substances are particles distributed in space, reserving consideration of other options for later in the chapter.

You might wonder about the ontological status of space on such a conception of the universe. Space would be functioning as a kind of container providing an arena in which the particles go about their business. Is a container space a substance or a property? Properties are ways substances are. So, if space were a property, what would it be a property of? Perhaps a property of the universe as a whole. If space were a property of the universe, however, the universe would be a substance, hence simple.

This is an option to be taken seriously, but it is evidently at odds with an ontology of particles. So in the present setting it would seem more natural to think of space as a substance, a stage on which the particles play out their lives. General relativity tells us that space (or spacetime) has a topology, so, again, it might seem that space is a something that is particular ways, a candidate substance (here I am relying on Nerlich 2013).

Another possibility is that I am wrong, and that, in addition to substances and properties, there is space (or spacetime). Some hold that space is a network of relations among point particles. Given my views on relations, however, this is not an option I intend to address at present. Alternatively, space might be something else altogether, some third (or fourth if you admit relations) category of entity. The possibility is one I am in no position to rule out, but I shall ignore it for two reasons. First, I do not know what to make of it. Second, and more to the point, the ontological standing of space has no immediate bearing on what I have to say in this chapter.

4.2 The Essential Lowe

The assumption, then, at least for illustrative purposes, is that the universe comprises propertied particles, the substances, moving about in space and interacting in various ways. What about essences? Consider an electron. What is its essence? Here I follow E. J. Lowe: the essence of an electron is *what it is or would be to be* an electron (see Lowe 2006, 2012, 2018. This is what Lowe calls a general essence. The electron has, in addition, an individual essence: what it is to be this particular electron.

This way of thinking about essences has two important consequences. First, no entity could fail to have an essence. For every substance of whatever kind, there is something it is to be a substance of that kind, for every kind of property, there is something it is to be a property of that kind, and for every kind of complex, there is something it is to be a complex of that kind. Just as there is something it is to be an electron, so there is something it is to be the mass of an electron or the charge of an electron, and something it is to be an H_2O molecule.

Second, essences, unlike words, are not vague or indefinite. It cannot be vague or indefinite whether something is what it is. You could scarcely improve on Bishop Butler's formulation cited in § 3.8: 'Every thing is what it is and not another thing'. The significance of definiteness is hard to overstate, as I hope to make clear in the course of the chapter.

Such a conception of essences differs from conceptions that take essences to be entities of a special sort or to be influential 'top down' causal factors holding together and managing the affairs of complex objects (for discussion see Johnston 2006; Koslicki 2008; Marmodoro 2013; Koons 2014; Evnine 2016; Jaworski 2016, and Chapters 8 and 9). It differs, as well, from conceptions that identify essences with the microstructure of a thing or stuff, identifying the

essence of water, for instance, with H_2O molecules, which make up water. It might be the case that it is essential to water that it be largely made up of H_2O molecules, but this is not to identify water's essence with the molecules that make it up.

One reason it would be a mistake to regard essences as entities of any kind is that, as Lowe points out, if every entity has an essence, if there is something it is or would be to be an entity of that kind, then, if essences were entities, they would themselves require essences, and a regress of entities would ensue. This is no doubt an important point, but my focus will be on the implications of Lowe's way of thinking about essences rather than what might or might not be difficulties for its many competitors.

4.3 Thinking Comprehendingly

In characterizing general (I omit the qualification in what follows) essences as what it is (or would be) to be an entity of a particular kind, Lowe is channeling Aristotle (*Metaphysics* Z, 4). In previous chapters, I put it this way: to know or 'grasp' an essence is to know what it takes to be an entity of a particular kind. To grasp the essence of an electron would be to know what it takes to be an electron. To grasp the essence of a horse, would be to know what it takes to be a horse. To grasp the essence of mass or charge would be to know what it takes to be massive or charged. Lowe's further contention is that, in order to 'think comprehendingly' about anything, you need at least a partial grasp of its essence.

Lowe does not offer this as a theory of reference, but simply as a way of spelling out what is required for you to think about whatever you are thinking about. Suppose a horse is made up of a dynamic, interactive collection of particles. If you put the particles together in the right way, you have something worthy of being called a horse. When you point to a horse, you point to a collection of particles. In order to think about what you are pointing to as a horse, however, you need to have at least an inkling of what it takes to be a horse. For that matter, in order to think about what you are pointing to as a collection of particles, you need to know what it takes to be a collection of particles. It is no part of the view that you would need to be in a position to articulate or spell out what you know.

What Lowe has in mind by essences is not at all what philosophers who embrace some form of Locke's conception of 'real essences' have in mind (see, for instance, Kripke 1971). Locke characterizes real essences as 'the real

internal, but generally in Substances, unknown Constitution of Things, whereon their discoverable Qualities depend' (1690: III, iii, 15). For philosophers sympathetic to Locke on this point, the essence of water is H_2O and a horse's essence might be a particular strain of DNA.

You can 'think comprehendingly' about water or horses, however, while knowing nothing about molecular structure or DNA. Our knowledge of molecular structure and DNA is of recent vintage, the result of relentless empirical investigations. Scientists setting out to investigate the microstructure of water had to have some comprehension, some grasp of what it was they were investigating, and this would be to have some sense of what it takes to be water. But it would be a category mistake to imagine that this microstructure is an essence.

Robin Hendry has pointed out that talk of 'H_2O' is ambiguous as between talk of the molecule and talk of the stuff. Water molecules are indeed H_2O molecules. In the stuff, however, these interact so that, at the molecular level, matters are more complicated (see Hendry 2006, and forthcoming).

Lowe goes further, arguing that it makes no sense to suppose that essences are discovered by empirical investigation. Essences, he thinks, are knowable a priori, and a grasp of essences is required in order to pursue empirical investigations, including investigations into the microstructure of familiar objects. In this way, science incorporates both a priori and a posteriori, empirical elements.

The development of atomic theory led scientists to look for new elements, the essences of which they understood in advance. Attempts to find the Higgs boson required some comprehension on the part of physicists as to what they were looking for. All this is consistent with the possibility that, as scientific knowledge grows, we flesh out our understanding of imperfectly understood essences, and that we come to grasp new, previously undreamt of essences.

So here is a conception of essence as what it is (or would be) to be an entity of a particular kind, or, as I prefer, what it takes to be an entity of a particular kind. Traditionally, essences have been thought to be expressible by means of 'real definitions'. To know what it takes to be an electron or a horse, to grasp the essences of these things, is to be in possession of real definitions of electrons and horses. Your possession of such a real definition would equip you to think comprehendingly about electrons and horses, and to distinguish electrons and horses from things of other kinds.

Talk of real definitions should not be taken to suggest that essences are creatures of language, however. Essences are what they are quite independently of our ways of expressing or characterizing them. Because it is not

obvious that the invocation of real definitions adds anything to what has been said already, and because such talk is potentially misleading, I shall set real definitions aside.

4.4 It Is Never Easy

I have tried to paint Lowe's account of essences in a favorable light. As I hinted at the outset, I accept that there is something plainly right about what Lowe says. Surely, for anything at all, any particular thing, 'thing' covering any entity of any kind falling under any ontological category, there is something it is to be an entity of the kind it is and to be that very entity. Everything has what it takes to be what it is.

The plausibility of all this, however, its apparent inevitability, means that essences cannot bear the weight that Lowe and others put on them. Here I have in mind the idea that modal truths spring from essences, so an account of essences brings with it an account of modality, an account of contingency, possibility, and necessity. The idea is that whether something is possible or not, whether, for instance, something could or could not undergo various changes while continuing to exist, while continuing to have what it takes to be the kind of thing it is, or to be that very thing, is determined by the thing's essence.

You can begin to see why someone might think this is so by reflecting on a familiar example invoked earlier, a statue and the lump of bronze that makes it up at a particular time. Statues and lumps have distinct essences, so it would seem that the statue and the lump must be distinct but spatially coinciding objects, an idea taken up in § 3.9.

How could distinct objects spatially coincide? The thought is that this could occur when, and only when, the objects differ in kind. A statue could not spatially coincide with another statue, a lump of bronze could not spatially coincide with a distinct lump. Two statues would exclude one another as would two lumps, but statues and lumps do not get in one another's way. Would this mean that, if you have a statue over here and a lump over there, you could bring them together so that they coincide? No, the statue of necessity coincides with a lump, and that lump would fend off competitor lumps.

Out of the gate, it seems uncontroversial that what it takes to be a statue (or this statue) differs from what it takes to be a lump of bronze. Owing to differences in their essences, statues and lumps differ in their 'modal profiles'.

Given what it takes to be a lump, a lump, but not a statue, could undergo a dramatic change of shape. Given what it takes to be a statue, a statue, but not a lump, could survive replacement of some—and perhaps, over time, all—of the bronze making it up.

Your appreciation of these points stems from your appreciation of the essences of lumps and statues. What changes an object could or could not undergo while remaining the same object, or same kind of object, is not something you could discover by empirical investigation, but something you recognize because you grasp the object's essence, you know what it takes to be an object of that kind.

One complication here is that for kinds such as horses, there might be no definite answer to the question, what would it take to be a horse? Some things might clearly have what it takes to be horses, others clearly do not, and still others might or might not have what it takes.

The practice of classifying and labeling some things as horses seems not to require definiteness. But it would be unsettling to imagine that it could be indefinite what something's essence is. How could you have a something without that something's having what it takes to be a something of whatever kind it is, and indeed, the very something it is? 'Essence precedes existence!'

You might think that a lack of definiteness is not in fact a problem. Suppose, for instance, what it takes to be a tomato admits of indefiniteness. Even so, some things definitely have what it takes to be tomatoes, and some definitely do not. Why should the fact that there could be borderline cases cast the definite cases in a bad light?

Given that everything definitely is what it is, however, and that some things might or might not have what it takes to be tomatoes—where the 'might or might not' is not simply a consequence of a lack of information on our part—means that what it takes to be a tomato is ill-suited to be an essence in any but an attenuated sense, a sense tied to taxonomies embedded in the manifest image.

Another complicating factor is that most, perhaps all, entities are entities of very many different kinds. Take a particular horse, Phar Lap. Phar Lap has what it takes to be a horse. But any horse also has what it takes to be a herbivorous ungulate, a mammal, a vertebrate, a living organism, and, as we are supposing, a dynamic, organized collection of particles. Which of these, if any, is to be identified with this Phar Lap's essence?

Lowe responds to this worry by distinguishing a thing's 'fundamental general essence' which 'announces' the thing's ontological category, distinguishing it from various other kinds of which it is an instance (2018: 16). Thus

the fundamental general essence of a horse is its being a living organism, one that also happens to be an instance of the natural kind *horse*, the kind being, not an essence, but a universal.

Lowe is thinking that Phar Lap could—'could' is understood as expressing 'metaphysical possibility'—be transformed into an organism of a different sort while continuing to exist. Phar Lap could change into an oversized wombat, or perhaps even, like Daphne, into a laurel tree, without thereby ceasing to exist. In contrast, Phar Lap could not survive being changed into a pillar of salt, even a horse-shaped pillar of salt. So Phar Lap is essentially an organism, but not essentially a horse. At any rate, this is Lowe's view as I read him.

The details here are intriguing, but I forego discussing them because I mean to shift gears and come at essences from a different direction, one that takes essences seriously, but renders them much less thrilling.

4.5 Essences and Universals

Start with an ontology of (simple) substances and properties. It is an empirical question whether the substances are particles or fields, or spacetime, or . . . So what we think of as ordinary objects could be organized, interactive collections of particles, or they could be modes—disturbances in fields, for instance, or congealed regions of spacetime.

I have asked you to accept for the time being that the universe comprises particles distributed in space. In that case it would turn out that there are multifarious similarities across particles. Similar particles—electrons, for instance—could usefully be regarded as instances of the kind electron, each instance having what it takes to be an electron. The presumption is that electrons are essentially electrons. As I imperfectly understand it, an electron could survive a change in its location, but not a change in its intrinsic nature.

I am going to take seriously talk of 'instances' in the previous paragraph. This suggests that universals are in the offing. In Chapter 2, I initiated the assimilation of universals to essences. In contrast, many philosophers, Lowe included, consider universals, but not essences, to be entities belonging to a distinctive ontological category.

Suppose, however, you follow Aristotle, or Aristotle as I have portrayed him, identifying essences with Aristotelian forms, and think of forms as universals. The idea would be that universals are not members of a category of general entity, universals are essences, instances of which are substances, or modes, or complexes of substances. This electron has what it takes to be an

electron, its mass and charge have what it takes to be the masses and charges they are, this H_2O molecule has what it takes to be an H_2O molecule.

So I am identifying universals with essences and accepting Lowe's explicitly Aristotelian conception of essences as the what it is (or would be) to be an entity of a particular kind. On such a view, there are no *entia generalia*, no general or universal entities, only propertied substances apparently standing in various relations, where substances are particulars and their properties are particular ways the substances are: modes.

Thinking of universals in this way is to embrace something like Williams' conception of universals, what Campbell calls 'painless realism' (Williams 1959a; Campbell 1990: 43–5; and see § 12.4). Universals or essences, thus conceived, do no explanatory work, they in no sense constrain reality, and certainly universals need not have instances. This latter point is just a reflection of the idea that 'essence precedes existence', or, more prosaically, that it could be an open question whether anything has what it takes to be an entity of a given kind, a kind of particle, for instance. Indeed, a particle of the kind in question might fail to exist because it could not exist given what it would have to be were it to exist. (For the moment I shall postpone discussion of what this could mean, what this kind of impossibility could amount to, and return to it below.)

In a universe of particles there will be endless dynamic arrangements of various kinds of particle. Interpreting 'arrangement' broadly, these will include any collection whatsoever. Some collections will be included in others. Some will partially overlap, some will include far-flung constituents. In a minority of cases, however, particles will interact or coalesce, and, as is the case with the particles, similar such integrated arrangements, although a distinct minority, will be plentiful, a point you could appreciate simply by looking around. The most compact of these will constitute atoms and molecules. Interactive molecular collections will make up complex molecular structures. Still larger arrangements comprise complexes of substances, some of which would amount to what we regard as objects in the ordinary sense.

These remarks are not meant to startle or amaze, much less to invoke a subtle philosophical theory. They are intended only to describe in a general way what appears obviously true were the universe a universe of particles.

My less uncontentious suggestion is that any collection whatever, any arrangement of particles would constitute a something, each having what it takes to be an arrangement of its kind, and in fact that particular arrangement. The something might be fleeting, might be nothing anyone would ever notice or care about, but it is no less there, no less real for all that. It is no less real, no

less fundamental than the particles themselves, no less real than a hydrogen atom or a rigidly bound H_2O molecule. Because, for every arrangement there is something it is to be an arrangement of that kind, every particle and every arrangement of particles has an essence.

A majority of arrangements might strike you as 'arbitrary' or 'unnatural': think of 'made up' hokey philosophers' objects of the kind cooked up in § 3.7: a tomato, de Gaulle's nose, and coins tossed hopefully into the Trevi Fountain. These are no less instances of kinds or essences, they are just not instances of essences likely to excite anyone's interest. If an arrangement is no more than an aggregate, its identity conditions are easy (resembling the identity conditions of sets). In such cases, in most cases, the essence, the universal, will have only one instance: the very arrangement itself. In other cases, and in at least some of the cases you might take seriously, there could be many instances.

My emphasis on arrangements of particles is not intended to suggest that a complex object is nothing more than a collection or aggregate. In most cases, noteworthy arrangements will be highly interactive, and dynamically so. In many of these cases, particles affect one another upon entering into the arrangement. A water molecule is not simply an assemblage of two hydrogen atoms accompanied by an oxygen atom. The components of an H_2O molecule are atoms of hydrogen and oxygen linked by bonds in the pattern H–O–H. Such relationships are included in the essence of H_2O.

4.6 Slippage

In the case of particles and dynamically organized molecular structures, resemblance across instances would appear to be the rule. Presumably, hydrogen atoms exactly resemble one another as do H_2O molecules. (Matters are in fact more complex, but manageably so.) In other cases exact resemblance might be rare or nonexistent. Would it be right to say that instances of some essences are exactly alike while instances of other essences are less than exactly alike?

That would be a view, but it is not my view. If you take seriously the idea that, for any entity, simple or complex, there is something it is to be an entity of that kind, the entity has what it takes to be an entity of that kind, then intrinsic differences among entities, however small, would mark differences in kind. Here I am echoing points introduced in Chapter 3 (especially § 3.9) that are now coming home to roost.

You might worry that this makes kinds, essences impossibly recherché. Certainly they would not reflect everyday taxonomies or those commonly deployed in the sciences.

You could appreciate this failure to map, what I propose to call 'slippage', even if you held no brief for essences as I have presented them. It was noticed by functionalists and their fellow travelers, the nonreductive physicalists, decades ago. Slippage occurs when there is an apparent misalignment between, on the one hand, ordinary scientific and everyday taxonomies and, on the other hand, those we take to inform the scientific image. If you think of the scientific image as what is supplied by physics, slippage amounts to a misalignment of the taxonomies of physics and what we have in the manifest image, including the special sciences.

One way to diminish misalignment is to fiddle the higher-level taxonomies. This in effect is the time-honored aim of reductionism. You redefine higher-level terms using the lower-level vocabulary of physics or, if that proves unworkable, you introduce 'bridge principles' that provide links among items in higher- and lower-level taxonomies.

To achieve a match between higher-level taxonomies and the universe as depicted by physicists, then, reductionists adjust the taxonomies. Others, functionalists and nonreductive physicalists, for instance, take the opposite approach, keeping the taxonomies intact and adjusting the ontology. This is done by positing intermediary 'higher-order' or 'higher-level' entities to correspond to components of higher-level taxonomies entrenched in the manifest image. These entities are presumed to depend on, but be distinct from, lower-level realizing or grounding entities.

The result is a hierarchical, layered ontology in which higher-level entities correspond to higher-level taxonomies and are taken to be dependent on, necessitated by, yet distinct from, entities corresponding to lower-level taxonomies all the way down to the lowest level, physics.

To the extent that a higher-level item is taken to be 'multiply realizable', grounded in a motley of lower-level conditions, the messiness and lack of fit is, it would seem, merely relocated. We philosophers are adept at weaving carpets under which to sweep impediments.

4.7 Layers of Confusion

Both reductive and nonreductive approaches to slippage appear hopeless. Nonreductive physicalism was itself a response to awkward reductionist

programs that eventually came to be regarded as wrong-headed. But the nonreductionists brought with them a new collection of embarrassing difficulties. Broadly speaking, reductionist problems were semantic in nature, while nonreductionist physicalism introduced metaphysical conundrums. I shall not spend time here discussing these in detail, but point out two difficulties that have proved especially resistant to solution and, on that account, rate mention (see Morris 2018 for a detailed discussion).

The first of these concerned the apparent causal irrelevance of higher-level items. The problem reared its head first with the advent of functionalism and its conception of mental properties as multiply realizable, itself a product of worries about slippage. Thus, functionalism had it that, to be in a given mental state, to be in pain, for instance, was to be in a state, presumably a physical state, with the right sort of causal-dispositional profile, a state brought about by tissue stress or damage, perhaps, one that produced aversive behavioral and psychological effects. To have what it takes to be in pain is to be in some such state.

Pains were not identified with these states, however, but taken to be 'higher-order' properties. The 'pain property' is the property of having the property of being in a state with the right kind of causal-dispositional profile. This is a property shared by all creatures in pain, regardless of their physical makeup, regardless of differences in the intrinsic physical character of the states taken to realize pains.

A few functionalists, notably the two Davids, Lewis and Armstrong, eschewed this picture, following J. J. C. Smart and identifying states of mind with what others regarded as their physical realizers: your pain *is* a physical state with the right causal-dispositional profile. That very state would have what it takes to be a pain. This, however, was a distinctly minority view, most functionalists preferring to see states of mind as higher-order or higher-level states of minded creatures.

Now the causal relevance problem rears its head. If states of mind reside at a higher level, you might wonder how they could have a part in the production of physical effects. And, given the dependence of the mental on the physical, the production of a mental effect would require the production of its physical realizer, so the problem generalizes to mental effects of mental causes.

When you suffer a painful burning sensation in your hand as a result of carelessly grasping the handle of a hot skillet, you might think that your pain is what causes you to pull your hand away and bathe it in cold water. However it looks as though it was not the pain, but the physical realizer of pain, that brings about these and other physical (and subsequent mental) effects. The

pain itself is 'screened off'. Mental properties quite generally start to look epiphenomenal.

This is bad enough, but the point extends to all higher-level properties and states, including those prominent in the special sciences. These inevitably bottom out in the lowest level, the domain of physics. There, and only there, is where the action is.

Liters of ink have been spilled on attempts to solve this problem while preserving the underlying ontology, but I think it safe to say that none of these attempts has enjoyed anything approaching universal support. Once the hierarchical, layered ontology of nonreductive physicalism is in place, the causal standing of entities taken to reside at higher levels is compromised. The problem is one acknowledged by proponents of nonreductive physicalism, themselves, and it appears endemic to layered conceptions of the universe that take higher-level entities to be dependent on, necessitated by, but distinct from, fundamental entities enjoying a favored status.

A second problem faced by such conceptions is that of explaining what the proprietary dependence relations between higher- and lower-level entities could be. An early favorite was supervenience. Families of higher-level properties, mental properties, for instance, were said to supervene on families of lower-level, in this case, physical, properties. Supervenience was characterized as a necessitation relation, but the nature of the necessitation in question was left open.

The upshot was an unedifying theory according to which the answer to the question, what is it for a higher-level state or property to be dependent on a lower-level state or property, was given a purely formal specification with no ontological backbone: the lower-level state or property asymmetrically and synchronically necessitated the higher-level state or property.

Appeals were subsequently made to various realizing relations and to primitive grounding relations, but these, much like attempts to answer the problem of causal relevance, gained little support outside the immediate families of their proponents. All of these attempts held onto the hierarchical scheme, and no wonder. That scheme was responsible for the problems it was introduced to solve.

4.8 From Many to One

Before sketching an alternative picture, I propose to return to the earlier discussion of essences and extend it to a conception of the universe as

comprising, not particles moving about in space, but instead treats particles and complexes of particles as modifications of some underlying substance. This could be space itself, or spacetime, or the fields, or a single unified field: whatever the story turns out to be, it is hard to see how it could fail to include propertied substances. Again, to prevent the discussion from becoming impossibly abstract, I ask you to imagine that physics tells us that the fields are unified so that what we regard as particles or clumps of particles would be in reality local modifications of the one unified field.

On such a conception, what we had hitherto regarded as substances or complexes made up of substances, would be modes. In that case, the motion of a particle would be a wavelike perturbation in the field. What you might regard as an electron's moving through space by occupying successive spatial regions would in fact be successive occurrences in the field, a succession resembling a blush spreading over your face.

If something like this turned out to be the way things are, it would be wrong, or at least misleading, to describe the universe as one that lacked particles, or to deny the existence of particles. To recognize that the particles are not substances, but that they belong to another ontological category, is not to deprive them of existence, but shed light on what they are: their nature.

A second point to notice is that, given a monolithic, one-substance universe, what we previously regarded as complex objects, objects with substantial parts, the particles, would no longer have substantial parts, parts that were, or eventually resolved themselves into, substances. There would be just the one substance. What we had hitherto thought of as complex objects would be multifaceted modes, variegated, stain-like modifications of the one substance. Complex objects would not in any recognizable sense be made up of parts.

Such objects would certainly not depend on their apparent parts in the way you might ordinarily think of complexes as depending on their parts. Nevertheless there would be something it is to be an intricate modification of the one substance, any given modification would have what it takes to be a modification of its kind. And when this is so, you have the possibility of distinct modifications sharing an essence, each having what it takes to be a modification of that very kind.

When you give up the particles, boundaries between objects might be much less salient. To the extent that a mode were sharply circumscribed, it would admit of definiteness. But what are commonly regarded as objects would be unlikely to admit of sharpening, unlikely to have clear boundaries.

Once you think about it, you can see that this is not merely a mildly surprising consequence of a one-substance universe. The boundary

problem—if it is a problem—would hold as well for a universe of particles, a point emphasized in Chapter 3.

In a universe of particles, ordinary objects, including living organisms, would exhibit penumbrae of particles. In the case of living organisms you do not need to recruit exotic examples by way of illustration: think of a tear forming in the corner of your right eye, a flake of dandruff, or material ingested, digested, and expelled. Where substances or collections of substances, including interactive collections, begin and end is a definite thing, but where what we regard as ordinary objects, including organisms, begin and end would be difficult and likely impossible to pin down. This would be no less so in a universe of particles than in a one-substance universe in which things other than the substance are modes, modifications of a cosmic substance.

4.9 Engaging with the Universe

None of this affects essences, but it does bespeak slippage, the mismatch between our taxonomies and what there is as characterized by physics. Slippage is perceived as a problem only because we start with the assumption that science and our everyday give and take with the universe requires an alignment of taxonomic categories we deploy across the sciences, on the one hand, and, on the other hand, essences or instances of essences. If you take essences, as I have, to be what it is (or would be) to be a thing of this or that kind, and, crucially, if you think of essences as mind-independent, slippage is all but inevitable once you move beyond physics.

Given that we can think about and interact with the universe with moderate success, given that we can refine our everyday understanding of how things are by deploying the special sciences, success in these endeavors could not depend on perfect taxonomic alignment. Taxonomic categories operative in everyday life and in the special sciences equip us to accomplish what we need to accomplish more or less successfully. These categories capture what is required for this kind of practical success. If you have some sense of what it takes to be a tomato, you can shop for tomatoes at the supermarket, grow them in your garden, slice them up for salads. Botanists have a somewhat more refined sense of what it takes to be a tomato.

So you could think of tomatoes, or anything else, as having an essence in an attenuated sense, Episcopalian essences, roughly the same sense in which you could think of complex objects as themselves having properties. As another bishop, Bishop Berkeley, recommends, 'think with the learned, speak with the

vulgar'. It is true that some things, some states of the universe, some dynamic, interactive collections of particles, or variegated modifications of the one substance, have what it takes to be tomatoes, others fall short. These states of the universe are mind-independent as are the similarities and dissimilarities that hold among them. Taxonomies we devise manage to capture, with varying degrees of precision, these similarities and dissimilarities. Whether philosophers like it or not, this gives us all we need to engage with the universe.

4.10 Dénouement

Where exactly does this leave essences? Essences considered, not as entities, but as what it is (or would be) to be an entity of whatever sort, what it takes to be an entity of that sort, are there for the having. They exact no ontological cost. At the same time they are supremely unexciting, providing little in the way of explanatory payoff. That there is something it takes to be an electron, for instance, and that many things have what it takes to be electrons, reflects rather than explains the existence and the nature of electrons. What of electrons' modal profiles? An electron must have unit negative charge and could not fail to have a certain mass. Well, anything that did not have unit negative charge or that certain mass would not have what it takes to be an electron.

Could there be a particle resembling an electron, but with a slightly different mass or charge? The question does not admit of an easy answer, and it is certainly not something you could work out by contemplating essences. Physics might be in a position to provide an answer to the question, but that is far from guaranteed. Ultimately, reality calls the shots concerning what is or is not possible.

What of the attenuated, Episcopalian essences underlying everyday and special scientific taxonomies? Are these nothing more than Locke's 'nominal essences'? It is true that a tomato could not survive certain changes just as a statue could not survive a dramatic change of shape. But, again, this is just to say that anything that failed to have what it takes to be a tomato would not count as a tomato, would not be a tomato.

This does not mean that being a tomato is a matter of convention. That 'tomato' means what it does might be a matter of convention, but similarities and dissimilarities among ways the universe is that are tracked by our use of the word are there quite independently of our interests and conventions. There are lots of tomatoes, lots of things that have what it takes to be tomatoes. There

would be tomatoes even in the absence of any reflective convention-wielding creatures. The fact that we care about some ways the universe is and not others does not compromise the standing of those ways we care about.

What goes for essences goes for kinds and universals understood as I have suggested. Following Aristotle as I read him, I have assimilated kinds and universals to essences. Whatever there is has an essence, has what it takes to be what it is, to be an entity of its kind. In this way, every entity is an instance of a kind or universal. Some entities are substances or have substances as parts. Others are properties, modes, ways substances are. All of these have what it takes to be what they are, and thereby admit of being regarded as instances of universals: substantial universals, corresponding to Aristotelian substantial forms, and property universals, corresponding to accidental forms.

Now, however, we are well and truly embedded in the manifest image. In 'thinking comprehendingly' about tomatoes or tables, or lumps of bronze, we deploy taxonomies of greater or lesser refinement. These taxonomies reflect mind-independent similarities that, for whatever reason, speak to us.

Modal discourse about tomatoes, tables, and lumps of bronze can issue from our understanding of what it takes to be a tomato, or a table, or a lump of bronze. But, again, to say that a tomato, for instance, could or could not survive certain kinds of alteration, is just to say that whatever survived such alterations would or would not have what it takes to be a tomato. To say that a tomato must have a particular characteristic, is just to say that anything lacking that characteristic would not have what it takes to be a tomato. A facility with modal discourse of this kind befits intelligent agents equipped to negotiate their surroundings.

Appeals to essences fall well short of providing a fully illuminating account of the modal character of the universe, however. For anything whatever, ϕ, you know nothing could be ϕ without having what it takes to be ϕ. But knowing what it takes to be ϕ does not tell you whether ϕ's are or are not genuinely possible, whether ϕ's are inevitable or optional. Neither essences nor their cousins, universals, constrain such possibilities. The deeper story lies with the nature of reality itself, and this is a story we can only hope to uncover by persistent empirical investigation with no advance guarantees of success.

Does essence precede existence? It is a tie!

5
Qualities and Powers

> Remember then: there is only one time that is important—Now! It is the most important time because it is the only time when we have any power.
>
> Tolstoy, 'Three Questions' 1903: 298

5.0 Qualities

The universe around us, the lived universe, the universe of the manifest image, is a raucous affair: colorful, boisterous, odoriferous, resistant in places, pliable in others. This is the universe depicted by landscape painters, described by novelists and poets, and investigated by biologists and meteorologists. The lived universe, the universe as we find it, is a universe imbued with qualities. A tomato is red, spherical, and pungent. A rabbit is brown and furry. A brook sparkles and babbles.

The indisputable truth is that we are surrounded by objects we experience and characterize qualitatively. 'Quality' and 'property' are near synonyms. If asked to list an object's properties, you are apt to enumerate its qualities—its color, its odor, its shape, its heft, its texture. Ordinary objects have the qualities they have owing to the qualitative nature of whatever makes them up. Every cook knows that the qualities of the ingredients of a cake make a difference to the cake's qualities. An audiophile knows that the qualities of the components of a loudspeaker determine the quality of the sounds it produces.

Not much imagination is required to move from the thought that familiar objects owe their qualities to the qualities of things that make them up to the idea that this is so quite generally. Assuming that the universe is corpuscular, the qualities of whatever we experience, and indeed qualities of experiences, stem from qualities of the insensible particles, the quarks and leptons, as it might be.

You might doubt that quarks and leptons have qualities. Quarks and leptons have characteristics, but how could these be qualitative? The characteristics of the particles are invariably identified exclusively by quantitative differences

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they make in interactions with one another in accord with the various forces. Quarks and leptons are colorless, odorless, silent agents that go about their business with the utmost stealth.

Quite true: you cannot see or hear or smell the qualities of the insensible particles, which are, after all, insensible. We infer their presence only by their effects on their fellows, effects that can be augmented and transformed so as to produce visible or audible signs of their presence: streaks in cloud chambers, clicks in Geiger counters.

If it is implausible to think that the insensibles are green, or fuzzy, or warm, it is not implausible to suppose that they have some distinguishing qualities that serve to mark them off as members of distinct species of insensible.

This thought appears to fly in the face of a much more respectable thought that insensibles are to be identified and distinguished, not qualitatively, but purely quantitatively, and in particular by reference to their measurable effects on one another. These are stalked in laboratories, and they are what undergird laws formulated to capture their nature. This is close to the idea that the properties of the insensibles are empowering, an agreeable thought to many. For an electron to have a particular mass or charge, for instance, just is for it to have a complement of powers the exercise of which can be captured in equations invoked in accounts of the electron's activities.

Here it is worth calling to mind another option that currently enjoys considerable respectability. This is the idea that characteristics of anything at all including the insensibles are exclusively qualities. These qualities figure in contingent laws of nature governing the behavior of whatever there is. There is nothing about an electron's charge itself, a quality of the electron, that inclines the electron to repel other electrons and attract protons. There are, however, laws ensuring that this is so. The laws could have been otherwise. The electrons and protons could have been just as they are qualitatively, while their interactions were altogether different.

This conception of the role of laws made an appearance in Chapter 3, and I shall return to it later in this and subsequent chapters. Meanwhile, I mention it simply in order to note that the idea that characteristics of the insensibles, whatever they turn out to be, are qualities is by no means a philosophical outlier. On the contrary, it is an altogether natural way of thinking about the ingredients of the complex objects that populate the manifest image. Qualities of those things result from qualities of whatever makes them up.

I am leading up to the idea that characteristics of objects, their properties, and ultimately, properties of the substances that make up the universe, are best

understood as qualities that equip their possessors with powers to behave as they do in concert with their qualitatively imbued brethren if there are any. One way to put this is to characterize objects' properties as 'powerful qualities'. This is a nice phrase that I myself have often used, but it is potentially misleading and, in philosophy, when something has the potential to mislead, someone will inevitably be misled.

The idea that properties are powerful qualities is not the idea that properties or qualities exercise powers: substances, or objects made up of substances, are powerful, and what they have the power to do, or have done unto them, turns on how they are qualitatively. The downside of describing qualities, as distinct from qualitied substances or objects, as powerful, is that this could suggest to the easily suggestable that substances themselves are ontologically dispensable, inert somethings-we-know-not-what. If you have the qualities, why bother with the substances, the sole role of which is to serve as a 'support' for qualities?

If qualities are understood as modifications of substances, ways substances are, however, substances that are those ways are not bare we-know-not-whats decked out in qualities, but qualitatively suffused agents of stability and change. Because philosophers' talk of powers exhibits a distracting ambiguity (see § 5.4), it would be more apposite to speak of empowering qualities, with the understanding that it is the possessors of the properties, not the properties themselves, that are qualitied and powerful.

With this as a backdrop, I turn next to a discussion of powers—or dispositions: terms I use interchangeably—that begins with an extended exercise in philosophical brush clearing.

5.1 From Language to Ontology

Owing to the ever more technical nature of philosophical discourse and a steady rise of professionalism, the philosophical universe has become increasingly Balkanized. The onset of blinkered specialization has fueled a tendency to see metaphysical theses as discrete modular affairs capable of being combined, and recombined, mixed and matched so as to achieve some desired outcome. Philosophers have taken up diverse approaches to causation, to properties, to powers, to modality. It is all too common to find a philosopher embracing a view of one of these to solve some locally salient problem, then picking and choosing from among the rest so as to fend off hostile threats to the favored position.

This propensity is abetted by the practice of treating metaphysics as an extension of the philosophy of language. If you begin with language, however, you lose the unifying force of the universe on your doorstep. Many philosophers—you the reader among them perhaps—might regard this comment as impossibly naive. If the idea that we could read off ontology from language is a bad one, the thought that we might extract ontology from the universe as we find it is surely worse. Where would you begin? Would you start with a list of objects in your vicinity and work outwards? Not only would such a project be hopeless, it would undermine the kind of generality and integration aimed at in metaphysics.

Language might be an indispensable vehicle for our thoughts about the universe, including thoughts bearing on ontological matters (see Martin 1987; Heil 2012: chapter 12 for important reservations). But it is the universe, or ways the universe is, that makes those thoughts true or false. Knowing what we quantify over, what we regard as existing, is to know what truths, or presumed truths, we accept. But this is not at all the same as knowing the nature of the truthmakers for those truths. Physics comes closest to giving us an unvarnished account of the truthmakers for truths that have truthmakers. This is what makes physics physics. Against this background, ontology gives us our best systematic account of categories of truthmaker.

Such a conception is neither grandiose nor reductionist. The claim is not that all the truths are reducible to, that is, replaceable by, analyzable into, or derivable from, truths of physics. Think about it. It can be true that your cursor moves across your computer screen even though the truthmaker for this truth is an immobile, stationary array of pixels exhibiting a dynamic pattern of illumination. It could be true that a baseball sails into the left field bleachers even if the motion of baseballs were at bottom something like the cursor's motion. Truthmakers for claims about moving baseballs could be wavelike disturbances in fields. To conclude from this that, really, there are no baseballs or that baseballs do not in actuality sail over fences, would indeed be reductionist. But such a conclusion would be deeply misguided.

Philosophers embarking on ontological projects like to invoke Plato's image of 'carving the beast of reality at the joints'. But, as noted in Chapter 3, reality is replete with joints. The problem is not that of finding joints, but of understanding how categories we deploy in apprehending the universe select the joints they do.

In previous chapters I have tried to make a case for the thesis that, when you consider these categories at the most general level, you arrive at an ontology of substance and property. Substance and property are correlative categories.

Substances are property bearers, properties are borne by substances, properties are particular ways substances are, modes. Any property is a way some substance is, and every substance is some way or other.

Suppose this is right. Particularity rules. A fully particular universe, a universe lacking in general or universal entities, *entia generalia*, provides all the resources we need for making true, not only the singular truths, but also the general and universal truths that have truthmakers. This in fact is an historically prominent position, although you would never suspect that if you confined yourself to by-the-book analytic metaphysics.

So much for preliminaries. The time has come to ask what it would be to regard properties—qualities—as disposing or empowering objects to do whatever they do, would, or could do.

5.2 Powerful Substances

Start with the manifest image. Objects we encounter in our everyday give and take with the universe, no less than objects scrutinized by the sciences, appear to affect and be affected by one another. Indeed our givings and takings with the universe are apparently instances of our affecting and being affected by objects and occurrences in our surroundings. We, and the objects we encounter, would seem not to be impotent, but to possess assorted powers or dispositions to affect and be affected by other objects.

Plato is often cited as the author of the idea that power is the 'mark of reality':

> A thing genuinely is if it has some capacity, of whatever sort, either to act on another thing, of whatever nature, or to be acted on, even to the slightest degree and by the most trivial of things, and even if it is just the once. That is, what marks off the things that are as being, I propose, is nothing other than *capacity*. (*Sophist* 247e)

But now, given an ontology of propertied substances, where do you locate objects' powers? What is the 'ground' or 'basis' of dispositionality?

Substances are powerful. An electron has the power to repel other electrons and to attract positrons. An electron has this power by virtue of being negatively charged. An electron is not merely negatively charged, however: an electron has a determinate, that is, a definite, negative charge. And this would seem to be a property of the electron, a property the electron possesses

along with various others: a particular determinate mass, for instance, and a particular determinate angular momentum or 'spin'.

In supposing an object's properties empower the object, powers are comfortably embedded within the substance–property ontology endorsed earlier. This strikes the parsimony-minded as needlessly profligate. Why substances? Why not simply powers? An ontology consisting of powers alone (or powers standing in various relations to one another) might be valued for its simplicity. Science could be thought to demand powers, but substances appear to be distinctively philosophical posits, mysterious substrata, somethings-we-know-not-what, artefacts, perhaps, of provincial subject–predicate forms of speech. (See Campbell 1976: chapter 6 for a discussion Boscovich's universe of powers, and § 12.6.)

Although philosophers like to wield Ockham's Razor as a kind of sword of virtue, as noted in Chapter 2 it is self-defeating to invoke parsimony as a tool to be deployed out of the gate. Simplicity comes into play, if at all, only late in the game, only in comparisons among fully developed theories with a common subject matter. One theory can be simpler than another in one respect, but only at the cost of greater—often hidden—complexity elsewhere. Whether an ontology of powers alone (or powers plus relations) is simpler, all things considered, than an ontology of substances and properties is by no means obvious.

So why think substances are needed? Suppose I am right in depicting substances and properties as correlatives: if you have one, you have the other. Philosophers who regard themselves as savvy about science sometimes evince scepticism about substances on the grounds that the universe as described by physics looks anything but substantial. Perhaps our universe is not a universe of 'things' at all, perhaps it all comes down to fields pervading space, dynamically evolving over time, or the wave function unfolding in an *n*-dimensional configuration space.

The thought that a substance–property ontology is committed to an unrelenting corpuscular conception of 'things', would be premature however. The ontology leaves open the nature of whatever substances there are. Given what we think we know, the substances might be corpuscular specks of matter in motion, but they might be fields, or spacetime itself, or multidimensional configuration spaces (provided these are not purely mathematical constructs), or something as yet unfathomed. Particles are candidate substances, but particles might belong to the manifest image, particles might be disturbances in fields, dynamic eddies in some encompassing stuff. In that case what you might have thought were substances—electrons, say—would turn out to be

modes of some substance, not substances themselves but local ways some substance is.

To accept a substance–property ontology is to accept the idea that, whatever the final theory, there will be items, maybe many, maybe just a few, maybe only one, playing the substance role, somethings that are various ways, and ways those somethings are. I am not aware of any scientific theory that fails to fit this template, although there are certainly philosophical interpretations of scientific theories that deny it.

5.3 Powers as Relations

On one of these interpretations the ontology that best suits physics is an ontology of pure relations. You might arrive at such a view if you thought that science is in the business of identifying powers, and that powers are ultimately to be understood wholly in terms of relations: a power is what it is owing to relations it bears to all the other powers and to its manifestations.

This way of putting it is misleading, for on the view under consideration, there are no its standing in relations to other its. Powers lack intrinsic natures, powers are not 'quiddities'. Powers are constructed on or from relations. The result is a species of 'Humean supervenience' according to which everything supervenes on a vast network of relations. Given the relations, you have everything else.

The position is difficult to appreciate because it is natural to think that relations require nonrelational relata. To have a relation you must have one or more somethings to relate. The relational view is more ambitious. Relations are taken to be prior to relata: relata are what you get when you have the relations. (An excellent early statement of this view can be found in Dipert 1997; see also Ladyman et al. 2007; Esfeld 2016, 2020; and Chakravartty 2017 for discussion.)

If such a conception has any plausibility at all, it does so primarily by construing powers as relations. If you thought that powers were relations, and you thought that powers are all there is, you would have a purely relational universe. (I shall return to this conception of the universe in Chapter 12.)

But why imagine that powers are relations?

Powers are the powers they are by virtue of what they are powers *for*. Water has the power to dissolve salt, salt the complementary power to be dissolved by water. A case can be made for hooking powers up this way. Think of the long Aristotelian tradition of distinguishing 'active' and 'passive' powers, or Sydney

Shoemaker's 'forward-' and 'backward-looking' powers (Shoemaker 1980). A power owes its identity to its manifestations (presumably in cooperation with other, reciprocal powers).

Given that powers' manifestations are themselves powers, a power's identity is determined by its relations to all the other powers. Put this together with the view that the universe as revealed by the sciences is a universe of powers, and it is but a modest leap to the thought that everything in the universe is constituted by relations. (I leave aside the further question of what the universe itself is.)

This much seems correct: to say what a power is, to identify a power, is to say what the power is a power for, typically in concert with other powers. This does not imply that powers are themselves relations.

In Chapter 2 I expressed reservations about the ontological standing of relations. Granted there are irreducible, irreplaceable relational truths. Truthmakers for these truths, however, could turn out to be nonrelational ways the universe is. I believe that this is the best way to understand what were traditionally called internal relations. The idea that the nature of things standing in relations could somehow be dependent on what relates them has matters exactly backwards.

Whether you are with me on this point or not, I hope you will agree that it is a mistake to construe powers themselves as relations. We characterize a power relationally by saying what the power is a power for, that is, by reference to how the power *would* manifest itself in concert with various other powers. But powers in no sense depend on the presence of reciprocal powers or on their manifestations. If being a power meant standing in relations to manifestations, no power could be unmanifested. An electron does not lose the power to repel electrons if it resides outside the light cone of other electrons. Indeed a power might be, not simply unmanifested, but unmanifestable because the reciprocal power that would be required for its manifestation is spatially or temporally out of reach or simply does not exist. Powers are, as C. B. Martin would have put it, 'ready to go', but might never go.

5.4 Real Powers

Today few would deny that the identity of a power is determined by what the power is a power for. But properties empowering objects, or at least familiar properties (or 'properties') of ordinary objects, can empower their possessors in different ways with different kinds of reciprocal manifestation partner.

Before going further, I should explain what I had in mind in § 5.0 when I alluded to an ambiguity suffusing discussions of powers. Many philosophers accept the idea that objects owe their powers to their properties. Sometimes, this idea is expressed as the thesis that properties themselves are powers or, as I have sometimes put it, powerful qualities. This way of talking has its roots in a venerable distinction between dispositional and nondispositional, categorical properties, a distinction most strongly associated with Gilbert Ryle (although Ryle himself would not have approved of the direction taken in subsequent discussions of dispositions; see Ryle 1949: 43).

Devotees of powers took up Ryle's distinction, identifying dispositional properties—dispositions—with powers. Ryle held that dispositions could be single- or multi-tracked. A disposition is single-tracked if its manifestation could only be brought about by one kind of stimulus. A multi-tracked disposition is a disposition that could be triggered in more than one way. If you then identify dispositions or powers with properties, powers would in many cases be 'multi-track', at least this would be so when the properties in question are characteristics of complex objects: one and the same power could manifest itself differently with different kinds of reciprocal power.

E. J. Lowe objects to this way of individuating—counting—powers, preferring a more fine-grained scheme according to which powers are always single-tracked (Lowe 2010, 2011). Suppose, for instance, that the sphericality of a billiard ball is responsible for the ball's rolling (rather than sliding or tumbling) down an inclined plane, for the ball's making a circular (rather than square) concave impression in the carpet, for the ball's displacing a spherical region of the atmosphere, for the ball's looking spherical, and for its feeling spherical. One property, many powers.

After arguing that powers must be counted in this more fine-grained way, however, Lowe proceeds to characterize powers as properties. You could be forgiven for finding this difficult to understand. A billiard ball, in addition to being spherical, would possess a property—a mode—for each of the powers that stemmed from its sphericality. This reintroduces the idea that powers are properties, just not the properties such as the ball's sphericality or mass, which are not, according to Lowe, powers.

I accept Lowe's distinction, but not the accompanying ontology. Ordinary objects are empowered by their qualities, but one and the same quality can dispose or empower an object in many different ways with different kinds of reciprocal partner: one quality, many powers.

The key here is reciprocity. Attempts to classify powers by reference to manifestations induced by 'triggers' or 'stimulus conditions' take on board a

kind of asymmetry absent in nature. Salt is disposed—has a power—to dissolve in water. When you stir a spoonful of salt into a beaker of water what happens? Is it that the water triggers the salt's disposition to dissolve with the result that it dissolves?

Such a description is unperspicuous. When you stir a spoonful of salt into a beaker of water, the salt and water engage interactively to yield a saline solution (see Ingthorsson 2002; Huemer and Kovitz 2003; Heil 2012: chapter 6). This interaction hinges on cooperation among powers of the salt and powers of the water. The interaction is continuous and fully symmetrical. There is a sequence here: the salt is introduced into the water, the water and salt interact, with the outcome being a saline solution. But if your interest lies in the nature of powers or dispositionality and, ultimately, in the nature of causation, you will want to focus on the cooperation, the mutual manifesting of the pertinent powers or dispositions objects possess owing to their properties.

5.5 Powers as 'Higher-Order' Properties

Powers are characterized by reference to their manifestations, but not by these alone. Powers are characterized by reference to their manifestations with particular kinds of reciprocal partner. This way of thinking about powers was a central theme in Martin's work on dispositionality (Martin 1993, 1994, 1997, 2008). Solubility is a disposition to dissolve (in particular ways with particular kinds of liquid). Fragility is a disposition to break (when struck or dropped on a hard surface). A tomato is disposed to roll owing to the tomato's being spherical. Sphericality, a property of the tomato, equips the tomato to roll—when conditions are apt for rolling, that is, when the right reciprocal powers are on the scene.

Some philosophers prefer to think of powers or dispositions as 'higher-order' or 'higher-level' properties possessed by objects by virtue of those objects possession of lower-level, nondispositional, 'categorical' properties. Salt's solubility might be 'grounded in' or 'realized by' its molecular structure, a categorical property of the salt.

Why not simply identify this structure as the characteristic responsible for the salt's solubility? This is thought to be a problem because many different kinds of object are soluble. There is no single 'basis' of solubility, no unique categorical ground. So solubility must be a higher-level property grounded in or realized by a possibly open-ended collection of categorical realizers.

One consequence of such a view is that it threatens to make dispositions—understood here as properties disposing objects in various ways—epiphenomenal. As Frank Jackson has put it,

> dispositions are not causes of their manifestations. Their categorical bases do all the causing, where by the categorical basis of a disposition in some object, I mean the property of the object responsible for its having the disposition; that is, the property responsible for the object's being disposed to behave in the way definitive of the disposition in question. Consider, to illustrate the point, a fragile glass that shatters on being dropped because it is fragile, and not (say) because of some peculiarity in the way it is dropped. Suppose it is a certain kind of bonding between the glass molecules which is responsible for the glass being such that if dropped, it breaks. Then the dispositional property of being fragile is the second-order property of having some property or other, bonding *B* as we are supposing, that is responsible for the glass being such as to break when dropped. And the first-order property, bonding *B*, is the categorical basis of the fragility. But then it is bonding *B* together with the dropping, that causes the breaking, there is nothing left for the second-order property (second-order in the sense of being the property of having a property), the disposition itself, to do. All the causal work is done by bonding *B* in concert with the dropping. To admit the fragility also as a cause of the breaking would be to admit a curious, ontologically extravagant kind of overdetermination. (Jackson 1998: 91–2)

This line of reasoning put in an appearance in Chapter 4, and I shall return to it in later chapters. It will be familiar to anyone who has dipped into ongoing debates over mental causation. If mental properties are not identifiable with, in the sense of being reducible to, physical properties of conscious agents, they must be higher-order properties, a status that threatens to render them causally inconsequential.

The idea is that dispositions could not be identified with their categorical bases for the same reasons nonreductive physicalists think mental properties could not be identified with physical properties. (A nonreductive physicalist, recall, is someone who thinks that psychological properties, for instance, depend on, but are distinct from, physical properties.) Start with the idea that mental states depend in some fashion on physical, likely neurological, states. It would seem that creatures with very different kinds of physical constitution could nevertheless be in the same mental state.

Suppose human beings, rabbits, and octopodes are all capable of feeling pain. Human beings, rabbits, and octopodes have very different physiologies. Thus pains, and mental states generally, must be multiply realizable. And so, thinks Jackson, are dispositional properties, properties empowering objects. A disposition is a second-order property: the property of having a property 'responsible for the object's being disposed to behave in the way definitive of the disposition in question'.

You might think that a second-order property is a property of a property, but that is not the idea. The properties Jackson and the nonreductive physicalists have in mind are properties possessed by an object owing to that very object's possession of some other property. To minimize confusion, I prefer to call these properties higher-*level* properties. So to possess a dispositional property is to possess the property of having a certain causally efficacious property.

What is the property of having a property? Suppose a tomato is red, and suppose that this is a property of the tomato: the tomato has the property of being red. By virtue of being red, the tomato has the property of having the property of being colored. Ask yourself what more there is to the tomato's having the property of having the property of being colored than the tomato's simply being red. True, something could be colored without being red. But anything colored is so by virtue of being some definite color or other. Colored objects do not possess two properties, (1) first-order property of being some definite color, red, say, (2) a higher-level property of being colored that, owing to its higher-level status, is causally impotent. A simpler way to make the same point: what makes it true that this tomato is colored is the tomato's being red.

Why not say the same in the case of powers or dispositions? Why not say that Jackson's the glass's bonding *B* just *is* the glass's being fragile, why not identify the disposition with its categorical base? Again, that move is taken to be blocked by considerations of multiple realizability. Many different kinds of object can be fragile, the categorical bases of fragility can vary enormously: one disposition, many different categorical bases. Now, however, we face an exclusion problem. Objects behave as they do, not because of their powers or dispositions but because of their nondispositional, categorical properties.

This has the aura of a bad joke. We explain why objects behave as they do by positing powers that are then dismissed as irrelevant to what the objects possessing them do.

Suppose, instead, you thought that for something to be fragile it need only have any one of an indefinite number of *similar* properties. The properties in question would empower their possessors in broadly similar ways. The

possessors would collapse, or shatter, or fall to pieces in the right sorts of circumstance. This, in effect, would be to identify dispositions with their categorical bases: categorical properties, or some categorical properties, are dispositional. That sounds odd only because 'categorical' is often defined as 'nondispositional'. This, however, is a mistake rooted in a latent antirealism about dispositions evinced by philosophical behaviorists.

Ryle, who codified the categorical–dispositional distinction, rejected the idea that dispositional predicates such as 'is fragile' or 'is soluble' applied to objects in virtue of those objects' states or properties. 'Dispositional statements are neither reports of observed or observable states of affairs, nor yet reports of unobserved or unobservable states of affairs' (Ryle 1949: 125). Ascriptions of dispositions, for Ryle, are purely if–then—conditional, 'noncategorical'—assertions, statements concerning what objects would do under various circumstances. These are to be distinguished from 'categorical' statements that say how things stand here and now, how they are unconditionally. Nowadays few philosophers attracted to dispositions take this antirealist line. For most, dispositions are presumed to be possessed categorically.

We are left with the thought that objects owe their powers or dispositions to their first-order, fully here and now, fully categorical properties. A given dispositional predicate can be used to identify any of member of a possibly open-ended family of similarly empowering properties. Just as there are many ways for something to be a tree or a table, there are many ways of being fragile, many ways of being soluble, many ways of being flammable.

Indeed it is hard to see how Jackson could avoid this conclusion. On his view, the causal work is done by a disposition's categorical basis, and this can differ from case to case. But if the causes are different, this ought to be, and is, reflected in differences in their effects, which we nevertheless classify as similar.

Appeals to multiply realizable higher-level properties are a product of what, in § 4.6, I called 'slippage', a mismatch across taxonomies. We recognize that accepted ways of thinking and talking about objects and their antics fail to align neatly with what we find when we look more closely at those objects through the lens of the sciences and, ultimately, through the lens of physics. We easily recognize some objects as being fragile, for instance, and recognize as well that objects can be fragile in all sorts of different ways: the 'bases' of fragility can vary widely. Philosophers hankering after taxonomic alignment introduce an intermediary, a property aligning perfectly with our talk of fragility and conveniently multiply realized by the various bases.

If it was mysterious how we could regard so many different kinds of thing as fragile, however, it is much more mysterious how a pristine property of fragility could uniformly arise from a motley of physical conditions. The conviction that meaningful commerce with the universe requires rigid taxonomic alignment led us into the fly-bottle of higher-level properties and nonreductive physicalism. Once you leave this conviction behind, the way is open to a resolution of the problems it introduces and reinforces.

5.6 Empowering Qualities

An object is as it is by virtue of its properties. In Chapter 3 I argued that, strictly speaking, property bearers are simple substances, substances lacking substantial parts, lacking parts that are themselves substances. Leptons and quarks aside, most of the objects we think of as peopling the universe would appear to be complex. Complexes owe their natures to the natures of their constituent substances and to ways these are interactively organized, and perhaps also to their circumstances. A soap bubble is as it is owing, not solely to its intrinsic makeup, but to atmospheric and gravitational influences as well.

The powerful things are substances and objects, electrons and soap bubbles, not their properties. These are powerful in the ways they are by virtue of their properties. Because it is negatively charged an electron has the power to repel other electrons and to bond with protons. Because it is spherical a soap bubble has the power to affect ambient light radiation so as to look spherical.

Objects have qualities and they have powers. The suggestion on the table is that properties or characteristics of objects are empowering qualities. Qualities and powers are not two species of property, not distinct 'aspects' of properties. If this strikes you as implausible, try to imagine a case in which you vary an object's qualities without affecting its powers, or vary the powers without affecting the qualities.

Thinking about an object's qualities and thinking about its being empowered, thinking about what it could do, are distinct ways of thinking, but distinct ways of thinking about the same thing. The distinction between an object's being qualitied and its being empowered is a distinction in conception only, what scholastic and early modern philosophers called a distinction of 'reasoned reason'. On the one hand, you can consider how an object is without considering what it could do. On the other hand, science is largely in the business of abstracting from objects' qualitative natures and considering just

their powers. From this it does not follow that qualities and what empowers objects are really distinct, much less that qualities are dispensable effluvia.

A conception of this kind comports with ordinary experience and affords a way of understanding how the qualitative and dispositional character of objects populating the manifest image could be inherited from properties of whatever makes up the subject matter of physics, occupants of the scientific image. Once you are clear on the nature of qualities and powers, the way is open to an understanding of the nature of causation and a resolution of the question whether causal relations are a species of 'founded' relation. This is one of the aims of Chapter 7.

Before extending the discussion to causation proper, I mean to pause and, in the next chapter, consider an important consequence of accepting a conception of properties as empowering qualities. I have in mind implications of this conception for our understanding of conscious experience.

6
Qualities Unbound

> Again and again the Cartesian picture of our own mind as something perfectly transparent to us stands in the way of philosophical progress. We must see our cognitive relation to our own mind as like our cognitive relation to anything else in nature. We know in part, guess in part, in part we are mistaken and in a large part we are simply ignorant. Being in a mental state entails nothing about our awareness of that state.
>
> D. M. Armstrong 1968: 115

6.0 Autobiographical Interlude

To this point, the book's focus has been on straight up metaphysical issues. You, the reader, are due a break. In this chapter I take a step back, consider some of the themes already partly developed, and apply them to puzzles surrounding the nature of consciousness, puzzles that occupy philosophers and non-philosophers alike. My aim is to convince you that these puzzles stem, not from the inscrutable nature of consciousness, but from metaphysical assumptions that cannot withstand examination. In that regard, the puzzles are archetypically philosophical.

Themes in this chapter stem from a spring 2015 presentation at a workshop funded by Durham University's 'New Directions in the Study of the Mind' project under the auspices of the ever optimistic Templeton Foundation. When asked to participate, I leapt at the opportunity. The prospect of learning about *new* directions being taken in the philosophy of mind is surely an exciting one. The old directions had proved to be quagmires and cul de sacs.

Maybe a new day *is* dawning. In June of the same year I attended the annual 'Toward a Science of Consciousness' conference, as it was then called, in Helsinki. In 2016 the event's title was officially changed to 'The Science of Consciousness'. Whereas, previously we were moving *toward* a science of consciousness, we have finally *arrived*. A new direction! Even better, a new direction with the imprimatur of science!

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All this might suggest to the philosophically innocent that studies of the conscious mind underwent momentous changes between June 2015 and June 2016. Could that be so? My impression in 2015 at the Helsinki conference was that what was being served up, at least by the philosophers, were incremental modifications of modifications of ideas that had been around at least since the 1960s and '70s, epicycles on theories that were being discussed when I was a PhD student decades ago.

This reinforced a latent scepticism concerning the suggestion that we have turned the corner in consciousness studies, at least where the metaphysics is concerned. Although I stand ready to be corrected, it is hard not to think that the bar for what counts as new in the philosophy of mind has repeatedly been lowered to accommodate diminishing expectations. What we have are not so much new directions as proliferating variations on entrenched doctrines advanced by parties unwilling or unable to budge from their starting points.

This assessment of the state of play is in fact what drove me, in the 1990s, from the philosophy of mind into metaphysics. The philosophy of mind, minus its empirical trappings, is after all a species of applied metaphysics. I had been spinning my wheels in ill-advised attempts to figure out mental causation, which, by that time, had come to focus on mental properties. How, it was asked, could mental properties be causally relevant to the production of physical, or, for that matter, mental, effects?

The concern arose because, as noted in earlier chapters, mental properties were widely presumed to supervene on physical properties, and this was taken to mean that mental properties were in some fashion distinct from, yet dependent on, physical properties. Most philosophers, while happy to allow that mental properties were physically 'realized', rejected the reduction of the mental to the physical because this seemed effectively to eliminate the mental. The problem was, and still is, regarded as especially acute for qualities of conscious experiences, commonly known as 'phenomenal qualities' or *qualia*.

6.1 The Puzzle

What exactly is the problem, what is the puzzle? What makes consciousness so mysterious and explanatorily elusive?

On the one hand, we are intimately acquainted with qualities of our conscious experiences, which, as we suppose, spring from occurrences in the brain and mediate our awareness of the physical universe. On the other hand, conscious qualities can strike us as altogether unlike those you find in the

nervous systems of conscious creatures or, for that matter, unlike anything studied anywhere in the physical sciences. How, if at all, could conscious phenomena be squared with the scientific image?

No answer seems satisfactory. Conscious qualities appear to reside at arm's length from the physical realm, but in that case we seem bound to accept some brand of unsavory dualism. Including conscious qualities among states and events of the kind studied by the physical sciences, however, obliges us to ignore everything about them that makes them so distinctive.

You can locate qualities of conscious experiences in the physical universe in various ways, but each of these ways exacts costs its opponents regard as impossibly steep. You could, for instance, embrace all-out materialism and simply deny that mental qualities have any special nonphysical character. This suggests, paradoxically, that our acquaintance with our own conscious experiences is illusory, a mere appearance. If appearances survive, however, the original problem of finding a home for them in an otherwise material milieu remains untouched.

Recognizing the problem, some opt for emergence: mental qualities 'emerge' when systems reach a certain level of complexity. Even if emergence were a robust phenomenon in the material realm, however, the emergence of distinctively mental qualities from anything nonmental has struck others as wantonly mysterious.

Sceptics about emergence who take consciousness seriously are increasingly drawn to panpsychism, the thought being that conscious qualities could not arise from something altogether nonconscious. So, if conscious qualities are real, as they surely must be, and if emergence is not an option, conscious qualities in some form must be present in what we had previously thought were insensate bits of matter that make up everything from piles of gravel to Nobel laureates.

Choosing from among these options is akin to settling on an interpretation of quantum theory. Each option has bands of earnest supporters convinced that science and common experience are on their side and that their opponents are delusional. The difference is that quantum theory has an impressive track record, whereas there really is, as yet, no comparably successful science of consciousness.

This kind of impasse is not uncommon in philosophy. Philosophical controversies flair up and spawn competing, often orthogonal, solutions, none of which is a clear winner. Refinements are added, rough edges smoothed, and bullets are bitten. Eventually, the problem recedes, not because it is effectively resolved, but because the community loses interest in it and turns its attention

to other problems deemed more pressing. Philosophers make moves, and remember, philosophers are not the only philosophers, that yield new problems, which they then set about trying to solve while holding constant the moves that produced the problems in the first place.

Although I shall not pursue the point here, it is worth taking a moment to reflect on the thought that the problem of consciousness (and, more generally, the mind–body problem) was not always with us. It would not have occurred to Aristotle, for instance, and assumptions required for its formulation only came together in the seventeenth century (see Matson 1966; King 2007). Today, although we take ourselves to have advanced beyond the kind of robust dualism advocated by Descartes, many of the core assumptions remain in place expressing themselves in malevolent ways.

Apologies for waxing cynical, but it is hard not to see the philosophy of mind through a kind of jaded Wittgensteinian lens that views intractable philosophical problems as, more often than not, of our own making. As Wittgenstein puts it:

> The first step is the one that altogether escapes notice....(The decisive movement in the conjuring trick has been made, and it was the very one that we thought quite innocent.) (Wittgenstein 1953/1968: § 308)

We are flies unable to escape the fly-bottle, not because the bottle poses an especially intricate challenge (the bottle is open at one end), but because we have committed ourselves to a particular trajectory, one that all but guarantees failure. At any rate, this is my diagnosis of the current state of play in the philosophy of mind, particularly when it comes to what David Chalmers calls the Hard Problem of consciousness (Chalmers 1996).

6.2 Making a Hard Problem Impossible

The Hard Problem does not arise for a Cartesian willing, as few today would be willing, to posit a real distinction between conscious minds and material bodies, between mental substances and nonmental, physical substances. It becomes a problem only when the Cartesian picture is scaled back, and the mental and physical are taken, not to be distinctive kinds of substance, but kinds of property, with mental properties presumed to be somehow necessitated by, but not identifiable with, physical properties. Mental and physical properties on such a conception are, as Descartes and his contemporaries

would have put it, modally distinct, but in a way that makes mental properties asymmetrically dependent on physical properties.

The acuteness of the Hard Problem is thought to stem from two seemingly incontrovertible features of conscious experiences. First, conscious states and processes differ qualitatively from physical states and processes. Even if you allow that your visual experience of a red tomato is intimately related to goings on in your brain—conscious experiences are thought at a minimum to be correlated with neurological processes—the qualities of your experience are nothing like qualities encountered by scientists who spend their careers studying brains. There is 'something it is like' to have a visual experience of a ripe tomato, for instance, and this is nothing at all like what you come across were you to examine, by whatever means, the brain of someone undergoing the experience.

The problem is taken to be especially resistant to solution because it is difficult to contemplate any imaginable empirical discovery's revealing anything remotely like qualities of ordinary conscious experiences in the physical realm. So, even if we post-Cartesians are confident that brains are the wellspring of consciousness, an account of how this is supposed to work appears hopelessly out of reach.

Second, conscious experiences are regarded as having an essential 'subjectivity'. Not only is there something very special that it is like to undergo a particular conscious experience, but, in addition, every conscious experience is like something only to whomever or whatever undergoes it. Your relation to the qualitative character of your own experiences is privileged. There is a fundamental asymmetry between your access to your own experiences and your access to anyone else's. (In consciousness studies, asymmetries abound.) Your access to your own experiences is direct, unmediated, the access of others is indirect and inferential. Often this is put in terms of differences between first- and third-person 'perspectives' on mental occurrences.

Together these two aspects of consciousness effectively bifurcate the universe along two axes. On the one hand, conscious qualities, phenomenal properties, *qualia*, differ qualitatively from their physical counterparts. On the other hand, conscious qualities, unlike physical phenomena, can be apprehended exclusively from the 'inside', only from a first-person perspective. Sciences that provide our best access to the physical universe take up an objective 'view from nowhere' constitutionally ill-equipped to tackle what is an essentially subjective domain (Nagel 1986). Science could address conscious experience only from the 'outside', the distinctive subjective inner character of experience remaining, like the Yeti, forever hidden.

Although most philosophers, scientists, and casual observers nowadays accept that consciousness in some way depends on or arises from physical states and processes, the nature of the dependence relation remains contentious. For a time philosophers were happy to advert to supervenience. The mental supervenes on the physical: there could be no mental difference without a physical difference. As Jaegwon Kim, himself a staunch proponent of mental–physical supervenience, recognized early on, this really is to say only that the mental and physical covary of necessity (see Kim 1990, and recall the discussion in § 2.1). Appeals to supervenience do nothing to illuminate the basis of the covariance.

For their part, neuroscientists sometimes speak of mental occurrences' having a physical 'substrate', but this is no more helpful than saying that mental states are supervenient or physically 'realized'. The mental is tied to the physical, but the nature of the tie remains inscrutable.

Besides being unilluminating, appeals to supervenience and realization bring with them a host of problems, including the aforementioned problem of 'causal relevance' of mental properties: given the nature of the dependence of the mental on the physical, how could mental properties figure in the production of physical or, for that matter, mental effects? Philosophers have circled round these issues and offered a variety of responses, but the responses have a uniformly desperate character that would lead them to be rejected out of hand were it not for the apparent hopelessness of the situation they are meant to address. Any port in a storm.

Under the circumstances, it is hard not to suspect that the problems we are trying to solve are of our own making, issuing from our approach to consciousness rather than the nature of consciousness itself. We begin by bifurcating the universe then devote ourselves to devising solutions to problems flowing from this bifurcation. If we are to see our way out of the fly-bottle, we must learn to see as optional, and indeed as objectionable, much of what we are encouraged to take for granted when we set out to study consciousness.

6.3 Primary and Secondary Qualities

One likely suspect is the traditional primary–secondary quality distinction. Primary qualities are properties of objects studied by the physical sciences, shape, size, mass, charge, and the like, that are presumed really to belong to the objects. Secondary qualities, in contrast, are taken to reside in the observer. These include colors, tastes, feels, odors, and sounds. Once you embrace this

distinction, you are committed to some form of mental–physical dualism, you are well inside the fly-bottle, and the game is up.

Two historical points bear mention here. First, in the case of natural philosophers such as Galileo, and, for that matter, Descartes, who invoked the primary–secondary quality distinction en route to the pursuit of physical theories, there really is no problem. Galileo and Descartes were happy to accept a kind of dualism that shunts secondary qualities off to a nonmaterial, mental host. Their interest lay in explaining indisputably physical phenomena, not in working out how consciousness might insinuate itself into an otherwise material universe. It is this latter project that gives rise to the Hard Problem.

Second, not everyone who spoke of primary and secondary qualities thought of the distinction as Galileo and Descartes did. Locke, for instance, appears to have a different, although related, distinction in mind. Locke describes secondary qualities as 'nothing but powers' to cause ideas in observers, but by this he appears to mean that the secondary qualities are nothing *in addition to* arrangements of the primaries. If you organize colorless particles in the right way, for instance, you get something red, hence something with the power to look red. This is so, even though individual particles are not themselves colored, hence lack this power.

One question is whether this places colors (and the other secondary qualities) in the mind as it does for Galileo and Descartes. Although Locke's use of 'idea' is notoriously slippery, he might be thinking of colors, redness, for instance, as belonging to colored objects, although the experiences, perceptions of colors, are in observers.

This possibility could be understood in two ways.

First, the redness in objects is itself colorless. An object's redness is what you get when you arrange the particles constituting an object's surface in the right way so as to produce experiences of redness in suitably equipped observers under the right conditions Here, an experience of redness is a conscious state itself exhibiting the quality we associate with redness, so-called phenomenal redness. A tomato would then be red only derivatively, only in the sense that it is configured so as to produce qualitatively red experiences, themselves reliable indicators of nonphenomenal redness.

Alternatively, you might think of qualitative redness as being in the object itself. When you arrange colorless particles in the right way, the result is something red. Just as a tomato's being spherical empowers the tomato to look spherical, so a tomato's redness equips the tomato with a power to look red, a power to produce experiences of red in observers. The experiences are not themselves spherical or red. The tomato is spherical and red. The

experiences are *of* something spherical or red, and whatever it is to have an experience of something spherical or red, it is not to be in a state that is itself spherical or red.

I would like to think this is Locke's view, but it is, in any case, *a* view, one that comports with ordinary beliefs about the universe. Why should anyone doubt that it is true? A long tradition in philosophy appeals to individual variations in color perception to consign colors to the minds of perceivers. Some contend that perceivers 'project' colors and the other secondary qualities onto perceived objects. Objects *appear* colored, but are not, or not really. Color vision is a matter of seeing the universe through colored spectacles that are in some manner attuned to differences in colorless configurations of colorless particles.

What would inspire someone to take up a view of this kind? The matter is especially pressing because of the supporting role it plays in generating the Hard Problem of consciousness. The Hard Problem is motivated in large measure by starting with vivid descriptions of conscious experiences that meant to call attention to qualities not to be found in the material universe. These are assigned to consciousness, thereby ensuring a chasm between qualities of conscious experiences and properties of material bodies. The fly has flown into the fly-bottle.

6.4 Qualities and Powers

At least part of the problem grows out of an implicit denigrating of qualities. The dialectic here is instructive. On one side, philosophers of a Humean bent, find powers deeply mysterious. How could you ever observe such things? How could an object's being as it is qualitatively, equip the object with a built-in potency or capacity? The pluriverse of David Lewis comprises qualities distributed in distinct, discontinuous spacetimes. The qualities are inert, 'pure quiddities'. For some, this is so obvious as to require no defense.

Others see things differently. Philosophers who make a point of letting science call the shots find *qualities* mysterious. To be is to be capable of interaction. Indeed, to perceive anything—a tomato, a meter reading, a galaxy—would seem to require our causally interacting with what is perceived. This turns properties of objects perceived into powers. And powers are powers, not qualities, and certainly not effete quiddities.

Suppose the science-driven philosophers are right, suppose the business of science is to explain why things behave as they do by discovering what it is about those things that is responsible for their doing what they do. Suppose, at bottom, a thing's properties themselves equip it to affect or be affected by other

things. Functionalists extend this picture to the mind. Seeing something red, for instance, or being in pain, is a matter of being in a state with the right causal–dispositional profile.

But now, what happens to qualities? If your focus were solely on explanations of the behavior of material bodies, including the bodies of sentient creatures, you could make the Galilean move and relegate qualities to minds. If, however, your aim is to understand how minds and conscious experiences might arise in a material universe, this move would in effect reinstate the Hard Problem.

One option would be to allow that some material properties are qualities, some are powers. Sphericality, for instance, seems to be a perfectly respectable quality of particular material bodies. The trouble is that, by virtue of being spherical, an object would roll and would look spherical. So sphericality, a presumed quality, would appear instead to be empowering. Perhaps the sphericality of particular material bodies resolves itself into powers that give rise to appearances of sphericality, conscious qualities. But this is scarcely an advance. It certainly seems that the perceived quality of sphericality is that very feature of objects responsible for their rolling and looking, and feeling, and if you were a bat or a dolphin, sounding, spherical.

Another option would be to suppose that there is a single property, sphericality, with different 'sides' or 'aspects', a Janus-faced property. It is, however, difficult to know what this could mean if not that the property of sphericality itself has, or is composed of, two properties, one qualitative, one empowering. Aside from worries as to whether properties could themselves have properties, a prospect I have suggested is delicate, this move obviously puts us back where we were, back in a universe comprising undetectable (because causally limpid) qualities astride muscular powers, the objects of serious science. And it was this picture that inclined us in the first place to bifurcate the universe into a nonqualitative material realm and a qualitatively rich nonmaterial realm of conscious experiences.

In contrast to these unpromising options, what happens when you adopt the recommendation advanced in Chapter 5 and suppose that qualities themselves, just as they are, could be what empower objects? At least part of the reluctance to accept such a conception of qualities involves a time-honored philosophical move from:

(1) the *x*s might be *F* or the *x*s might be *G*, and
(2) the *x*s are *F*

to

(3) the *x*s are not *G*

Reasoning of this kind leads some to conclude that, if a property is a quality it is not empowering (and vice versa), if a property is categorical, it is not dispositional (and vice versa), and that, if a property is physical, it could not be mental (and vice versa). If you grant that objects' properties of interest to the sciences are those equipping them with powers, however, it does not immediately follow that these properties are not qualities. Similarly, if you allow that properties of ordinary objects are qualities, it does not follow that they are irrelevant to what those objects could do—their powers.

Suppose you embraced the picture of properties offered earlier and accepted that properties responsible for an object's qualitative nature empower the object to do what it would do—in concert with other reciprocally empowered objects. This is a position to which I was introduced more than three decades ago in the course of somewhat one-sided conversations with C. B. Martin. You could characterize this as the view that properties are powerful qualities, although, as noted in Chapter 5, the label is inapposite. The idea is not that qualities are themselves powerful, powers are themselves qualitied. Rather, objects, ultimately substances, are qualitied and powerful, their qualitative and powerful natures being separable in conception only, not in reality.

More precisely the distinction I have in mind between sphericality as qualitative and sphericality, the very same sphericality, as empowering, is what Descartes, following Suarez and his scholastic teachers, would have called one of 'reasoned reason', not a 'real distinction', neither could exist apart from the other, nor a distinction of 'reasoning reason', as is the distinction between Peter and himself when you consider that Peter just *is* himself, nor a 'modal distinction', as in the case of the distinction between a particle and the particle's mass and charge.

If something like this is on the right track, it undercuts the temptation to exclude qualities from the material universe and relegate them to the mind. You could accept that material bodies themselves have a qualitative nature and that this nature is what equips them to affect us so as to be perceivable.

Now reflect on functionalism in the philosophy of mind, a view many have found attractive despite its apparent liabilities. Once you separate qualities and powers, you abandon resources that might be mobilized to reconcile functionalism and our sense that conscious experiences are qualitatively imbued.

According to functionalists, states of mind, including conscious states, are distinguished by their causal-dispositional roles. One way to understand this thesis is to think of minds as dispositional systems, what Martin called 'power nets'. Your going into a particular state, your having a visual experience of a tomato, for instance, or feeling a stabbing pain in your knee, is a matter of

certain dispositions being manifested, dispositions that occupy distinctive places in an interrelated system of dispositions.

So formulated, functionalism is silent about qualities, if any, of these manifestations and the states that give rise to them. Indeed it is thought to be a virtue of the theory that systems that differ qualitatively, might nevertheless be functionally indiscernible. States responsible for pains, physical states, presumably, with the right causal-dispositional profile in an octopus or a Martian might differ qualitatively in all sorts of ways from states that have this causal-dispositional profile in human beings.

This way of thinking allows objects' powers and qualities to vary independently. Once you reunite qualities and powers, however, the way is open to see that the qualitative nature of causal-dispositional states that characterize the minds of conscious creatures might be precisely what suits them for their roles in the system. The aptness of certain states to play 'the pain role' is inseparable from their being as they are qualitatively. Martian and human pains could differ qualitatively, yet, for all that, be painful, just as red objects can differ in their shades of red.

What about 'zombies' (Kirk 1974, 2005; Chalmers 1996)? For readers unfamiliar with the 'zombie possibility', in this context zombies are not the undead, creatures that stagger about making trouble for the alive. Philosophers' zombies are creatures physically indistinguishable from human beings, but utterly bereft of conscious qualities. You could have a zombie twin whose physical makeup and behavior is indistinguishable from yours when you have a headache, but who feels nothing: 'all is dark inside'.

Suppose, however, that qualitativity and dispositionality were not separable, but the same thing differently regarded. You could not modify an object's qualities without changing its powers, or modify an object's powers without changing its qualities. This point is quite general and not confined to the psychological realm. Changing the qualities of the components of a clock, for instance, would result in a change in what the clock does or would do. Zombie clocks, exact causal-dispositional twins of ordinary clocks but differing qualitatively would be flatly incoherent. Changing the qualities changes the powers. Eliminating the qualities eliminates the powers.

6.5 Experiential Qualities

You might accept all this and still resist the thought that it has anything to do with consciousness and qualities of conscious experiences. I hope to convince you otherwise.

Return to the secondary qualities. Could it possibly be right that these, or some of these, are qualities of material bodies? I have focused on color and, in particular, on redness. Doubtless, conscious experiences of redness *correspond* to some feature or features of material bodies, but how could experienced redness, 'phenomenal redness', be *identified* with that feature?

Among philosophers of mind, there is considerable aversion to this kind of identification. How could 'phenomenal red' be anywhere *other than* in the mind? Certainly the label 'phenomenal red' and talk of red *qualia* encourage the thought that experienced redness is a distinctively nonmaterial phenomenon. But if phenomenal red is just what we experience when we look at a ripe tomato in bright sunlight, then why not side with common opinion and locate it in the tomato? Experienced redness is the redness of the tomato, an experienced quality, not a quality of an experience. This is what you get when you put colorless things together in the right way.

What of red *qualia* occurring in the absence of red stimuli: after-images, hallucinations, or technicolor dreams of tomatoes? Do such occurrences cast doubt on the idea that redness is a feature of objects in the 'external world'?

Suppose that dreaming, hallucinating, and experiencing red after-images resemble, qualitatively, ordinary visual experiences of tomatoes. (The supposition is probably false, but to exclude it in this context might look suspiciously ad hoc.) In the veridical case, the tomato, not the experience, is red. This would seem to suggest that a detached, non-veridical experience of something red need not itself be red. And, were that so, making redness a quality of an experience of red would be a kind of category mistake, an instance of what Ullin Place called the phenomenological fallacy, a mistake that contributes in a significant way to the sense that consciousness is deeply mysterious (see Place 1956 and Smart 1959). The universe is suffused with qualities. Some of these qualities belong to objects we experience, some belong to us, but there is no unbridgeable mental–physical qualitative discontinuity.

I have allowed that veridically experiencing something red might be qualitatively similar to dreaming about something red, or hallucinating, or experiencing a red after-image. But then what *are* the qualities of veridical experiences? Whatever they are, they are not to be confused with qualities belonging to what is experienced.

This simple point is easily missed because it is natural to describe your experiences by describing *what* you are experiencing, what your experiences are experiences *of*. Everything, including our experiences, has a qualitative nature. Having or undergoing a conscious experience is a matter of going into a state with a distinctive qualitative character. If experiences turned out to be

brain processes, then their qualities would be qualities of those brain processes, and these, or their effects, could be examined and measured by brain-probing neuroscientists.

6.6 Bodily Sensations

Ridiculous? Stay with me and pretend just for a minute that I might be on to something. Conscious experiences differ qualitatively from nonconscious states and processes, but not because conscious experiences are qualitatively saturated and nonconscious states and processes are qualitatively empty. Qualities are everywhere. I have been focusing on conscious experiences that are fundamentally perceptual in character. Qualities you experience in perception are, in many cases, qualities of what you experience. Experiences mediate your interactions with your surroundings, but experiences themselves are not a veil, not even a translucent veil, standing between you and what you experience.

So hallucinations, dreams, after-images, and the like might then be experiences qualitatively resembling perceptual experiences minus the experienced objects and their qualities. If the experience of seeing a red tomato is not red or spherical, why suppose that the experience of having a round red after-image itself is round and red. Dreaming that you are seeing a red tomato would not be to be in a red, tomato-shaped state, but to be in a state in some respects similar to the state you are in when you see a red tomato, whatever that state is.

Many readers will remain sceptical of this line of thought. I have focused on a single example, visual experiences of colored objects. What of smells, tastes, sounds, experiences of pain or nausea, feelings of euphoria or anxiety. What of mental imagery? Could these phenomena be treated in the same way? Even if the redness we experience when we encounter a ripe tomato resides in the tomato, how plausible is it to think that your awareness of a pain in your knee, or your feeling nauseous are analogous?

Bodily sensations, or at any rate, some of them, differ importantly from ordinary perceptual experiences. Compare a visual experience of a tomato with your experience of pain in your knee. The tomato, not your experience, is red, but, in the case of pain, it would seem to be the experience itself that is painful. Suppose this is so, indeed suppose it is so for bodily sensations generally. It would follow that, if experiences are, and are not simply 'correlated with', neurological goings on, then the neurological goings on must have the pertinent qualities. But is that credible?

David Armstrong offers an account of bodily sensations, according to which, your bodily sensations are internal perceptions of your own bodily states (Armstrong 1968: chapter 14). These are largely, but not uniformly, veridical. Your experiencing a pain in your knee might, on a particular occasion, be your becoming aware of your knee's being in a damaged state as a result of your knee's being in that state. As in the case of phantom pains, your awareness could be nonveridical: you might be in a state very like the state you would be in when you experience your knee's being in a damaged state, but not as a result of your knee's being in that state.

You might worry that this divorces pains from feelings of pain, pains from the awareness of pain, in an unfortunate way. Although there are probably cases in which you are in pain without being aware of it, the converse appears unintelligible. You can seem to see a rabbit on the lawn without there being a rabbit on the lawn. This might be so when you are in a state resembling the state you would be in when you do in fact see a rabbit, but one brought on by something other than a rabbit. Whatever its cause, if you are in a state that resembles the state you are in when you experience a pain, in contrast, you are, it would seem, in pain.

Thus, if ordinary experiences of pain were, as Armstrong contends, perceivings of bodily states, the perceivings, not the states perceived, would be identified with experiences of pain. Pain awareness could be induced by certain kinds of bodily state, tissue stress, for instance. These bodily states produce painful experiences, the painfulness residing in the experiences, not in their causes. This leads Armstrong to identify pains with the awareness or experience of particular kinds of bodily state, states distinct, numerically and qualitatively, from the bodily states that produce them. And it would seem that if these states occur, they occur in the nervous systems of sentient creatures. Those states would be pain experiences.

You might dismiss this possibility on the grounds that it is simply a repackaged version of the long discredited 'type identity theory', a theory often, but mistakenly, ascribed to J. J. C. Smart (see Smart 1959). A type identity theory would be one that aligned psychological and neurological taxonomies, pairing up individual items in these taxonomies and identifying them with one another. But that was not Smart's considered view. The state you are in when you are experiencing a pain in the knee and the state a Martian is in when the Martian experiences a pain in a tentacle, could be very different neurologically. What makes them both experiences of pain is their being dispositionally and qualitatively similar. What counts as similar psychologically need not count as similar biologically or neurologically.

By now I hope you are in a mood to allow that this is not simply an ad hoc move, an evasive tactic designed to shore up a wobbly thesis about consciousness. It is, rather, another instance of a core theme running through the book as a whole.

Think, for instance, about tables, and pretend that every table is made up of a highly organized collection of particles. (Pretense is required because physics might lead us to abandon an ontology of particles.) When you point to the table, wax it, set it for tea, what you point to, wax, and set is a collection of particles. If you accept this, do you accept a type identity theory of tables? It is a long way from the thought this this table, and perhaps every table, is a collection of particles to the idea that categories deployed in categorizing furniture map smoothly onto the physicist's categories. Every table might be identified with some collection of particles, but those collections need not answer to a single physical predicate, need not correspond to a single physical type, or even a well-behaved disjunction of types.

In just the same way, experiential states of conscious agents might, one and all, turn out to be neurological states, without those states answering to biological or neurological types that map smoothly onto psychological or experiential types. Similarities captured by psychological and experiential categories need not align in any very interesting way with those captured by biological or neurological categories.

Just this and no more is the lesson of arguments popular in the 1980s 1990s advanced against reductionism (for instance, Fodor 1974, 1997). The tragedy was that a sensible taxonomic point was given an ontological spin, and we were set on the road to perdition, the road to layered conceptions of reality. Slippage in action!

6.7 Undergoing vs Observing an Undergoing

One source of resistance to the thought that your experience of a bodily sensation might be an occurrence in your nervous system turns on the fact that observations of brains reveal nothing resembling bodily sensations. 'Ha! What would my pain *look* like?'

As in the case of ordinary perception, however, it is important to distinguish your having or undergoing an experience, from my observing, itself a kind of experiencing, that experience. If your experience of a tomato turned out to be a brain state, why should my observing that state be anything at all like your being in that state? My observing that state is, after all, my being in an

experiential state in which what I am experiencing is an occurrence in your brain, not a tomato. It is unsurprising, then, that our respective awarenesses could differ qualitatively, or that my being in the state I am in could fail to disclose what it would be like to be in the state you are in.

Yes, but how could the particular qualitative painfulness of your experience be a quality of a neurological state or process? Even allowing that neurological states and processes have qualities, how could they have *these* qualities?

Indeed, you might reject this possibility out of hand on the grounds that it is impossible to see how you could get such qualities by putting together things that obviously lack them.

This objection, if apt, would lead to the conclusion that you could not get something colored by putting together things that are not colored. Scientists and non-philosophers remain untroubled by the fact that we lack a reductive story, a story that bridges the 'explanatory gap' between objects' physical characteristics and what we experience, in the case of color (Levine 1983 introduced us to the explanatory gap). But then why should bodily sensation be any different? Once you allow qualities into the material universe, why regard experiential qualities as fundamentally different from any others? They do indeed differ qualitatively from colors and shapes, but it does not follow that they differ ontologically.

This is not panpsychism. You need not imagine that qualities of bodily sensations need to be present in the quarks and leptons any more than you need suppose that colored objects must be made up of colored particles. Just as an explanatory gap between the tomato's redness and qualities of its constituents provides no reason to doubt that the tomato is itself qualitatively red, so the explanatory gap between the qualities of the constituents of neurological states and processes and experiential qualities affords no reason to doubt that those states and processes incorporate the pertinent experiential qualities.

Nor is this a matter of ascribing 'phenomenal' mental qualities to the nervous system. Part of what I am assuming is that 'mental' and 'material' (or 'physical') is a distinction in conception only: a distinction of reasoned reason. You could insist that this is manifestly absurd, but is it? My suggestion is that its presumed absurdity is what supports the apparent insolubility of the Hard Problem of consciousness.

Once you allow qualities back in, you can start to see the universe as hospitable to experiential qualities. Philosophers in the Aristotelian camp are keen to restore powers to the universe, but if objects' powers stem from their qualities we have the same grounds for restoring qualities. In both cases, the mistake is to expect it to be obvious how characteristics of complex objects,

characteristics of tomatoes, human beings, resulting from dynamic interactions among their parts, could serve as truthmakers for claims about such things.

Again, sauce for the goose is sauce for the gander.

6.8 The View from Somewhere

Finally, what of the objective–subjective divide? You are, it would seem, privy to your own experiences in a way no one else could be. Experiences are private, unobservable in principle from the outside. In contrast, goings-on inside your body, including goings-on in your brain, are, at least in principle, observable by anyone with the right equipment. It is all well and good to suppose your experience of a red tomato is *correlated* with an occurrence in your nervous system. A neuroscientist might observe and measure your experience's neural correlate, the state that, presumably, 'gives rise' to your experience. But it makes no sense to imagine a neuroscientist's observing your experience.

Comfortable there in the fly-bottle? Think about it. What exactly would it be for a scientist to *observe* your experience? If we are careful to distinguish the qualities of what is experienced, the redness of a tomato, for instance, from qualities of the experience, it would be a mistake to expect a scientist observing your experience of a red tomato to observe something red and tomato-shaped. This opens the door to the possibility that your experiencing the tomato is an occurrence in your brain that could in fact be observed by others. Describing brain processes as correlates of experiences is just another time-honored way of stacking the deck.

What, then, accounts for the powerful sense that experiences are distinctively private affairs? Undeniably, there is a difference between something's *being in* a particular state and *observations* of something's being in that state. Suppose your undergoing a particular conscious experience is for your brain to be in a particular state. Now, imagine a neuroscientist's observing your brain's being in that state. The neuroscientist's observing your brain state is itself a matter of the neuroscientist's being in a distinct experiential state.

What reason is there to imagine that the neuroscientist's experience of your experience of a red tomato should resemble your experience of a red tomato or, more generally, that a neuroscientist's observation of a conscious state could yield an awareness of 'what it is like' to be in that state, whatever the state? Observing a state reveals what *the state* is like, not what it is like to *be in* the state. Assuming that it makes sense to identify experiences with

neurological states or processes, undergoing and observing the undergoing of an experience are chalk and cheese.

What of the elusive 'what-it's-like-ness' of experiences? All sides agree that knowing what it is like to experience red requires having visually experienced something red. The point is a perfectly general epistemological point having nothing in particular to do with experiential qualities. Knowing what an echidna is like requires encountering an echidna, or pictures or descriptions of echidnas, or creatures you know to be echidna-like.

At the risk of adding a distracting complication, I feel obliged to insert a caveat here. Suppose, as I have suggested, that in hallucinating something red or experiencing a red after-image you are in a state that qualitatively resembles the corresponding veridical state. If you could go into such a state without having previously gone into the corresponding veridical state, then you could, in principle anyway, know what it is like to experience something red without ever actually having experienced anything red. At any rate, you would have the raw materials required for such knowledge. Whether you would be in a position to make the requisite judgment is another matter.

None of this should be seen as especially controversial. If your visually experiencing a tomato or suffering a painful experience is a matter of your being in a particular state, a scientist's experiencing that state, visually, for instance, is a matter of the scientist's being in a particular state. These states, yours and the scientist's, need not be similar, qualitatively or otherwise, in fact it would be astonishing if they were. If knowing what it is like to be in a particular state requires being in, or having been in it that state, knowing what it is like to experience a tomato visually differs from knowing what it is like to experience a visual experience of a tomato.

The subjectivity of experiences stems, not from their in-principle unobservability from the outside, but from the relatively humdrum distinction between something's being in a particular state and someone's observing that state. The distinction applies to mental and nonmental phenomena alike. A quantity of water's being in a liquid state is one thing, your observing the water's being in that state something else altogether.

Please do not imagine that I am asking you to embrace yet another implausible theory of the mind. I am not asking you to embrace any theory at all. What I am urging is just that you come to see as optional theses that have led to our languishing in the fly-bottle: 'the fault, dear Brutus, is not in our stars, but in ourselves'.

7
Causation

> Were the inmost essence of things laid open to us, we should then discover a scene, of which, at present, we can have no idea. Instead of admiring the order of natural beings, we should clearly see, that it was absolutely impossible for them, in the smallest article, ever to admit of any other disposition.
>
> Hume 1779: 174–5

7.0 Prologue

If you are still with me after six chapters and a foray into the consciousness minefield, I am hopeful that you will be willing to remain on board for the rest of the journey. This chapter provides an account of causal relations that picks up where Chapter 5 left off. Put in its simplest terms, causation is a matter of objects' mutual manifestings of powers or dispositions. This approach reverses the order of explanation favored by philosophers who seek to provide causal accounts of dispositionality.

My aim here is to convince you that the acceptance of powers brings with it a seismic ontological shift that leaves behind a host of widely accepted metaphysical theses. You might not find the resulting picture immediately appealing, but I shall be satisfied if I at least manage to make clear the extent to which conceptions of causation and laws of nature frequently taken for granted, in fact rest on substantive theses, often theses with unwholesome histories, theses very much in need of defense.

7.1 Causal Production

Put a potato into a hot oven, and the potato grows warm. This would seem to be an uncontroversial example of a causal sequence. The oven's heat *causes* the potato to become warm. The potato's warmth *results* from its being placed in a hot environment. The heat of the oven *brings about* the potato's being warm.

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Causation, or efficient causation, is, or appears to be, a matter of something's being brought about by, or resulting from, something else. But what is it for something to bring about something else? What is it for something to result from another something?

Causal relations are often presumed to be relations among distinct events. One event, the oven's heating the potato, causes another, the potato's growing warm. The relation is asymmetrical (causes precede effects), non-reflexive (no event causes itself), and transitive (if *A* causes *B*, and *B* causes *C*, then *A* causes *C*; think of the butterfly effect). Some philosophers, self-styled Humeans, hold that all there is to *A*'s causing *B* is that *A* and *B* are suitably spatially and temporally related (*A* precedes *B*, and *A* and *B* are spatially and temporally contiguous) and there is a true generalization of the form: whenever you have an *A*, you have, or will have, a *B*.

Although it is doubtful that Hume was a Humean, I follow the current practice—codified by David Lewis—of labeling the doctrine described here as Humean. (The epigraph at the outset of this chapter and Strawson 2015 portray a different and more complicated Hume.)

On such a conception, causation would be an excellent example of an external relation. One way to think of an external relation is as a something in addition to its *relata*: you could have the relata, just as they are, without their standing in the relation. Spatial relations are commonly presumed to be external. Ignoring for a moment arguments to the contrary in § 2.3, Socrates's being 10 meters from Simmias is, or at least might be thought to be, an external relation. You could have Socrates and Simmias, just as they are intrinsically, without their standing in this relation. If God wants to make it the case that Socrates is 10 meters from Simmias, God must not only create Socrates and Simmias, God must, in addition, locate them 10 meters apart.

Similarly, for a Humean, you could have this *A* and this *B* without its being the case that *A* caused *B*. This would be so, for instance, had *A* and *B* occurred just as they do, but in a universe in which it is not generally the case that whenever an *A*-type event occurs, a *B*-type event occurs.

Apart from other difficulties, appealing to the general to explain the particular might be thought to have the order of explanation backwards. The generalization would seem to hold, if it does, because particular *A*s cause particular *B*s.

Other philosophers prefer to think about such matters modally: causes necessitate their effects. The oven's heat, perhaps together with the potato's being in the oven, necessitates the potato's being warm. But if causes necessitate their effects, what exactly does this modal connection amount to? We

have a candidate modal truth, but what might serve as a truthmaker for this truth?

A related worry applies to counterfactual accounts of causation. If, in a particular case, *A* causes *B*, then, had *A* not occurred, *B* would not have occurred. That seems right, but now the question is, when the counterfactual is true what makes it true. What are the truthmakers for counterfactuals?

Contemporary philosophers are apt to appeal to alternative universes in explicating modal assertions. If the *A*s necessitate the *B*s, then every universe that includes *A*s and *B*s, *A*s are generally followed by *B*s. True, if the *A*s genuinely necessitate the *B*s, then it would seem that any particular *A* will be accompanied by a *B*. It is not just that *A*s and *B*s co-occur, however, not even that they co-occur in many universes. Rather the *A*s are in some fashion *responsible* for occurrences of *B*s. The *B*s are there *because* of the *A*s.

What of the counterfactuals? There are many universes, many 'possible worlds', some similar to our universe in particular respects, some not at all similar. Now consider those universes most similar to our universe in the relevant respect. (This respect could be different in different contexts.) It is true that, had *A* not occurred, *B* would not have occurred if, at universes most similar to our universe but in which *A* does not occur, neither does *B*.

I shall have more to say about this way of thinking about modality in Chapter 10. At present it is perhaps enough to call your attention to the strangeness of the thought that, whether an *A* causes a *B* here and now, turns on what happens elsewhere, indeed on what happens at alternative universes.

7.2 Causation and Laws

If the mere holding of a generalization—whenever there is an *A*, there is a *B*—sheds no light on what *A*'s bringing about a *B* might amount to, what happens when you replace bare generalizations with laws? When an *A* causes a *B*, this is an instance of a law governing *A*s and *B*s. If it is a law that *A*s are accompanied by *B*s, the law would imply the corresponding universal generalization. So the generalization, which earlier had been seen as explaining a particular causal relation, is itself explained by the law: the generalization holds because the law holds. This looks like a move in the right direction.

But what are laws? Some philosophers think that laws are to be understood modally in terms of necessitation—necessarily, if an *A* occurs, a *B* occurs—explicating this relation by reference to alternative universes—at universes

very similar to ours *A*s are invariably accompanied by *B*s. This takes us back to unadorned universal generalizations, which have proved unhelpful in clarifying the nature of causation.

Armstrong, in contrast, argues that laws are entities, higher-order states of affairs incorporating universals (Armstrong 1997). Suppose it is a law that the *A*s cause *B*s. *A* and *B* are universals, general constituents of particular states of affairs. The law is a necessitation relation holding between *A* and *B*, guaranteeing that when you have an *A*, you will have a *B*. The form of a law of this kind is *N*(*A*, *B*). Armstrong regards it as a virtue of the theory that the *A*s necessitating the *B*s yields a universal generalization: whenever you have an *A*, you have a *B*.

Armstrong offers a modal account of laws in which modalities are understood in terms of relations among universals. Any such view faces a number of difficulties. I shall mention just two.

First, the account requires the invocation of universals, peculiar kinds of general entity capable of being wholly present in each of their instances. This, at any rate, is how Armstrong sees it. Others prefer to think of universals as existing apart from their instances, indeed apart from the spatio-temporal realm altogether. On this view, something's being an *A* is a matter of its standing in a relation to *A*, a universal, an entity subsisting in an incorruptible Platonic realm of *abstracta*.

Certainly it is true that many, perhaps most, philosophers today are happy to embrace universals, often without devoting much thought to their ontological status. In fact 'property' is widely taken to be synonymous with 'universal'. It was not always so. The status of universals as a kind of default conception of properties is a relatively recent and philosophically myopic episode in the history of philosophy.

In Chapters 2, 3, and 4 I explained why I believe there are many reasons to think of properties as modes, fully particular ways objects are. I shall not rehearse those reasons here. Nor am I counting on your sharing my antipathy toward universals conceived of as general entities. You should be aware, however, that Armstrong's approach to laws, one in which laws are special kinds of entity makes sense only given Armstrong-style universals.

A second difficulty for the idea that laws are universals is more straightforward philosophically. As noted already, Armstrong's laws, or statements of them, entail true universal generalizations. This is thought to provide support for the thesis. But as Nancy Cartwright has long insisted, these kinds of universal generalization are rarely true (Cartwright 1983 and many

subsequent publications). The universe appears to be a complex affair comprising all manner of interconnections and interactions. Thus, an *A* might yield a *B*, but only in the presence of a *C* or in the absence of a *D*.

You might hope that these kinds of 'exception' could be built into the law. It is not the *A*s that necessitate the *B*s, but the *A*s, together with the *C*s and in the absence of any *D*s. This preservative maneuver has the effect of complicating laws and their associated universal generalizations beyond all recognition.

Another approach takes laws to apply only under 'ideal conditions': the *A*s can be said to necessitate the *B*s provided we eliminate or ignore various details and interfering factors. But then how are we to understand ordinary non-ideal cases? Would these sometimes involve 'violations' of laws, an odd thought? In what sense could a law to the effect that the *A*s necessitate the *B*s explain a particular *A*'s yielding a particular *B*, when sometimes *A*s fail to produce *B*s?

A third approach replaces exceptionless necessitation with probability raising (see, for instance, Williamson 2009). The occurrence of an *A* raises the probability of an occurrence of a *B*; the *A*s tend to produce *B*s. But again, what, other than the absence of a *B*, distinguishes cases in which an *A* succeeds in producing a *B* from cases in which an *A* fails to produce a *B*? And when an *A* occurs and a *B* occurs, what makes it the case that the *A* brought about or produced the *B*?

The fact that the *A*s increase the probability of *B*s, the fact that *A*s tend to be accompanied by *B*s, does not take you from an *A* to an occurrence of a *B*, any more than an inconclusive vote takes you to a winner. If there really were no difference, other than the occurrence of a *B*, between cases when an *A* occurs unaccompanied and cases in which an *A* is accompanied by a *B*, the sense in which the *A* was responsible for the *B* would be left wholly mysterious. C. B. Martin puts it this way:

> This is not a naïve complaint about indeterminacy—I am pointing out a metaphysical gap. The gap resembles a nomination procedure for a disjunction of candidates that does not decide among them. Were it to elect one disjunct or candidate, it would decide for one rather than another, and be determinate between them. If there is not such a selection or production of one disjunct rather than another between the candidates, there is no election nor a production of a disjunct at all. The explanation of the success of a candidate or production of a disjunct, short of magic, would be incomplete, and the links in this disjunctive linkage would not take us to the result, but only to a pre-result determination of disjunctivities. (2008: 72)

If you find cases of probabilistic causation unproblematic, if they do not unsettle you ontologically, you are going to find most of what I have to say here unpersuasive. I suspect that the sense that there is no special difficulty in the *A*s causing the *B*s, but only sometimes, stems from two sources. First, it is easy to think of cases in which, owing to natural complexities, *A*s occur in concert with *C*s or *D*s, thereby changing the dispositional circumstances. Second, the sciences give us probabilistic laws. You could accept probabilistic laws, however, without thereby accepting probabilistic, on again off again causing. If you accept that causing is the bringing about of effects, then you would do well to spurn talk of probabilistic causation. Meanwhile, you might wonder why anyone would be attracted to the idea of probabilistic causation?

Suppose you started with Humeanism or with the thought that laws of nature imply true universal generalizations. On reflection, you come to accept that these generalizations are almost never unqualifiedly true. This might lead you to posit probabilistic laws that support, not universal generalizations, but probabilistic generalizations. And if you imagine that causal processes are instances of such laws, you have probabilistic causal processes. The idea inherits a measure of respectability from the fact that quantum physics seems irreducibly probabilistic.

So the occurrence of an *A* makes the occurrence of a *B* probable: The *A*s 'problify' the *B*s. This appears at least to capture what we actually encounter in everyday life and in the laboratory, and, in that regard to be an improvement over accounts of laws that imply exceptionless universal generalizations. But this takes us back to a conception of causation that elides the idea that causes bring about their effects.

Is this inevitable? Is it a mistake to think of causes as producing their effects? I doubt it. The mistake is to force talk of causation into a conception of the universe as comprising objects that do what they do owing to laws. The laws govern objects' behavior. Laws regiment. Laws establish what objects could or could not do. Objects, like good soldiers, dutifully obey the laws.

On such a view, laws stand apart from the objects they govern. The very same objects might have behaved altogether differently had the laws been different. The same soldiers, given different orders, march differently. A conception of this kind took root in the seventeenth century and is nowadays regarded by many as gospel. I suspect that philosophers who accept the conception accept as well that it is a philosophically innocent product of science. Science trumps philosophy. If science tells us that laws govern the behavior of objects, who are philosophers to quibble about the ontology?

As is often the case in discussions of this kind, however, it is not science that is in question, not scientists' appealing to laws in offering explanations of occurrences, but tendentious philosophical reconstructions of science and scientific practice.

Scientists deploy principles and equations in describing and explaining goings-on in the universe. Suppose we take scientists at their word and call these principles and equations laws. Laws can be true or false, accurate or inaccurate. Laws can be probabilistic. But laws, so conceived, are not entities, not components of the universe, not somethings in addition to forces, particles, fields. If laws are, broadly speaking, representational, however, if laws can be true or false, it is appropriate to ask what makes them true, what it is about the universe in virtue of which they hold.

7.3 External Relations, *Auf Wiedersehen*

In general, accounts of causation that appeal to laws of nature regard laws as contingent—in the sense that laws could vary independently of whatever they govern—are casting causal relations as a species of external relation. Suppose it is a law that negatively charged particles exert repellent forces on one another, and suppose this law is contingent: you could have a universe with the same kinds of negatively charged particle but without the law. In such a universe the particles might behave entirely differently.

In Chapter 2 I evinced doubts concerning the ontological standing of external relations (see also Heil 2009, 2012: chapter 7). One of the aims of this chapter is to complete that discussion by extending it to causal relations. In so doing, I shall briefly revisit some of the considerations set out earlier and develop them further. I hope to do so in a way that acknowledges the appeal of relations. I do not believe it is possible to produce definitive arguments here, or in metaphysics generally, but I have a measure of confidence that the conception of relations and relational truths sketched here and in Chapter 2 will prove appealing to ontologically serious readers.

The earlier discussion turned on the idea that internal relations are 'founded'. Truthmakers for claims about such relations are intrinsic, nonrelational features of their relata. As metaphysical assertions go, this one is relatively uncontroversial. What is controversial is the further claim that all relations are founded. Both spatial relations and causal relations are commonly regarded as paradigmatically external. In Chapter 2, I called on Keith Campbell for considerations favoring the idea that spatial—and by extension,

temporal—relations are in fact internal relations, postponing discussion of causal relations, the focus of the current chapter.

Although many of our most venerated philosophical forbearers regarded external relations with suspicion, few philosophers today would be moved by their concerns. We have, by and large, grown accustomed to the idea that that relations are upstanding citizens of the universe. As in the case of universals, we have learned what questions *not* to ask. More than 100 years ago Russell established to the lasting satisfaction of many philosophers that relations are indispensable (Russell 1903). We ineliminably 'quantify over' relations in mathematics and in the empirical sciences. Relations have paid their dues.

It is probably true that relational predicates are ineliminable. We could not say all we want to say about the universe without them. Attempts to analyze relations nonrelationally or paraphrase relations away have proved awkward and unpromising. You can accept the indispensability of relational predicates, you can accept that there are endless ineliminable relational truths, however, without thereby committing yourself to the idea that truthmakers for these truths must themselves be relational features of the universe.

If this sounds paradoxical, that might be because you are implicitly invoking Quine's principle of ontological commitment, you accept the idea that we are ontologically committed to whatever we are obliged to quantify over in our best attested theories. For readers unfamiliar with Quine, the idea, applied to relations, would be that, if you cannot but invoke relations in the sciences, especially physics, you are accepting that relations are 'out there', relations are mind-independent entities.

I prefer to think that Quine's criterion, at best, yields an accounting of truths to which our theories—suitably 'regimented'—commit us. This, however, leaves untouched the nature of those truths' truthmakers. You might think, as Leibniz thought, that there could be ineliminable relational truths, but truthmakers for these truths are nonrelational characteristics of the relata. Such a view is silent on the question whether you might be able to analyze relational predicates nonrelationally, or paraphrase talk of relations in non-relational terms.

As noted already, the idea that relational truths have nonrelational truthmakers could be equated with the idea that all relations are internal relations. I have characterized external relations as relations that are 'in addition to' their relata: you could have the *relata* (just as they are) without having the relation. An internal relation, in contrast, is a relation founded in its relata: if you have the *relata* just as they are, you thereby have the relation.

Similarity is a relatively uncontentious example of an internal relation. Imagine two patches of red. God does not have to make the patches and then, in addition, make them similar. If you have *these* patches, you have the patches' being similar. And what goes for similarity goes for dissimilarity, both are internal relations. To make the patches dissimilar, God need only modify either or both.

This might seem too quick. Suppose Socrates and Simmias are similar colorwise: both are pale. Surely God could have made Socrates and Simmias, the relata, without its being the case that they are similar. God need only give them different properties. Could God, however, have made Socrates and Simmias with their individual palenesses without its being the case that Socrates and Simmias are similar colorwise?

A better way to think about this point requires recognizing that in this case Socrates and Simmias are *relata* only accidentally. Socrates and Simmias are similar because they are similarly colored: Socrates' paleness is similar to Simmias' paleness. The pertinent *relata* are not Socrates and Simmias, but Socrates' paleness and Simmias' paleness. You could not have these very palenesses without their being similar. The assumption here is that the two palenesses are modes, not universals. Were they universals in the manner of Armstrong, similarity would dissolve into identity, another archetypically internal relation.

Internal relations are sometimes described as supervening on their relata, but I believe that this is just a somewhat infelicitous way of saying that truthmakers for internal relational truths are nonrelational features of the relata. The project of 'reducing' all relations to internal relations has enjoyed a long and checkered history in philosophy. Too often this took the form of attempts to recast relational assertions relying on a vocabulary stripped of relational terms. As Russell showed, however, it is easy to doubt that this is possible.

Another, equally unpromising strategy made use of the thought that you could replace relations with 'relational properties' presumed to be intrinsic to their possessors. Suppose Socrates and Simmias are 10 meters apart. Then Socrates possesses the property of being 10 meters from Simmias, and Simmias possesses the property of being 10 meters from Socrates. As Russell and Moore both pointed out, however, to say that Socrates possesses the property of being 10 meters from Simmias is at bottom just a philosophically disingenuous way of saying that Socrates and Simmias are so related (Russell 1903; Moore 1919).

I find the ontology of external relations ontologically inscrutable. However, my aim at present is not to disparage external relations, but merely to show that a certain way of thinking about causal relations and the causal structure of the universe renders causal relations a species of internal relation: truthmakers for causal claims are nonrelational features of what there is. This is not a matter of dismissing relations as inelegant or unparsimonious, but to establish that, once you have powers on the scene, the most natural and straightforward way to understand causal relations yields the result that such relations are internal.

The idea in play is that, if causal relations really are bringings about, producings, it would be salutary if we could locate something in the *A*s and *B*s themselves that would shed light on causation by illuminating what goes on when a particular *A* brings about a *B*.

7.4 A Power-Imbued Universe

Increasing numbers of philosophers are finding themselves attracted to the Aristotelian idea that properties, or some properties, equip their possessors with powers. A ball's sphericality equips the ball to roll; by virtue of possessing a negative charge, an electron would repel other electrons. Some philosophers who embrace powers hold that all properties, or at any rate, all intrinsic properties of concrete objects, are empowering. Others think that some properties empower, some do not.

In Chapter 5 I linked qualities and powers, characterizing qualities as empowering whatever they qualify. I suggested as well that causation was to be understood in terms of the mutual manifesting of powers. As Campbell observes, 'without powers, causation must remain mysterious, magical, and indeed occult' (Campbell 1990: 119). The time has come to make good on this suggestion.

Suppose that a ball rolls, or would roll, owing to its sphericality. It would, in addition, and owing to its sphericality, look spherical and feel spherical, and, as Kant observed, the ball's resting on a pillow would depress the pillow in a particular way. So conceived, the ball's sphericality is a way the ball is, an empowering way (in the sense spelled out in Chapter 5).

By my lights (and with an important class of exceptions) any power is a power to manifest itself in particular ways with particular kinds of reciprocal partner, particular kinds of reciprocal power. In this regard, qualities, or at least qualities of familiar objects, equip those objects to behave in diverse ways

in diverse circumstances, they are, as Ryle would have put it, dispositionally 'multi-tracked'.

The conviction that dispositionality is largely single-tracked stems from over-reliance on counterfactual and subjunctive conditionals in the identification of powers and from the deeply misleading idea that empowered objects are disposed to yield a particular kind of manifestation given a particular kind of 'stimulus'.

On the contrary. The manifesting of powers is, again with certain important exceptions, a thoroughly reciprocal affair. Because salt and water are as they are, water has a power to dissolve salt, salt a reciprocal power to be dissolved by water. To some this suggests that water has an 'active' power and salt a 'passive' power. Salt waits expectantly to be dissolved when the appropriate 'stimulus', water, is introduced, the manifestation being a saline solution.

When you look closely at what happens when you stir a spoonful of salt into a beaker of water, you see that the salt and water interact, the salt and water combine forces to produce a particular kind of outcome, a saline solution with new powers of its own (see Ingthorsson 2002). The process of dissolving is symmetrical, continuous, wholly reciprocal (Humer and Kovitz 2003).

If you want a simple model, think of two playing cards propped against one another so as to remain upright on a table. The cards remaining upright is a matter of the mutual manifestation of reciprocal powers of the cards, the table, the gravitational field, and who knows what else (the example is discussed in Heil 2012: chapter 6). This is the lesson of Kant's example of a ball's causing an indentation in a pillow. The ball and the pillow work together to maintain a particular indentation.

You might or might not find such a view congenial. I ask only that you consider its implications.

First, note that on such a view it would be a bad idea to explicate powers and their manifestations causally. The familiar schema (introduced in § 5.4)

Stimulus → Power/Disposition → Manifestation

cannot do justice to the reciprocal nature of manifestations. An ontology that includes powers provides ample resources for an explication of causation: causal relations would be the mutual manifestings of reciprocal manifestation partners, the manifestings of objects' reciprocal powers. Causes, or, better, *causings*, are understood in terms of interactions among empowered objects. Effects are the manifestations.

Second, the identity of an empowering property is bound up with ways in which the property would equip its possessor to manifest itself with particular kinds of reciprocal partner. If a ball's sphericality empowers or disposes the ball in various ways, these ways are reflected in a manifestation profile, all the ways in which a ball's being spherical would affect its interactions with various sorts of reciprocal partner.

Now take a step back and consider the implications of such a view for the nature of causation, the nature of causal bringings about. If the ball's sphericality equips the ball to roll down inclined planes in a particular way with particular sorts of reciprocal partner, then, when the pertinent partners are assembled, the ball rolls. The rolling is not something contingent, not something that depends on anything outside the dispositional matrix that includes the ball, the inclined plane, the gravitational field, and what have you. Given these, you have a rolling.

You might be sceptical. It would be easy to supply the ingredients of a rolling but prevent the rolling by the addition of further ingredients. Examples leap to mind. Suppose the ball were steel and you placed a powerful magnet beneath the inclined plane. Suppose the ball were prevented from rolling by a strong headwind. Or, the philosopher's all-purpose foil, suppose a wizard cast a spell that prevented the ball's rolling.

Such cases are not ones in which dispositions are 'blocked' or fail to manifest themselves, however, but cases in which different ensembles of reciprocal disposition partners yield different kinds of manifestation. Given the dispositions on hand, given the powers, you have the manifestations.

You could think of a universe of powerful interacting objects as a dense dispositional matrix evolving continuously over time. Its evolution would be fully locked in. Dispositions are dispositions for definite kinds of manifestation with definite kinds of reciprocal disposition partner. Once the dispositions are on the scene, the manifestations and their subsequent manifestations are going to be on the scene as well. The evolving matrix provides truthmakers for ordinary causal claims, as well as truthmakers for counterfactual claims concerning what objects would do.

If causation is the manifesting of dispositions, the identity of a particular instance of causation, a particular manifesting, is determined by the dispositions from which it stemmed. Given that manifestations are themselves dispositions for further manifestations, the identity of every manifestation is determined by its place in the matrix.

This is not a relational conception of the nature of dispositions. What a disposition is a disposition for does not depend on its relations to anything

else. An object's qualities dispose it to behave in various ways with various kinds of reciprocal partner. An object, an electron, for instance, that spontaneously materialized outside the light cone of any other particle would have the same powers, the same dispositional repertoire as electrons enjoying the company of other particles.

You might balk at the idea that the relation between dispositions and their manifestations is an internal relation. After all, the dispositional matrix evolves over time. What will be brought about tomorrow is absent today. Anything could happen between now and then.

Whether the future is out there waiting to become the present is a matter of controversy, but it is irrelevant to the issue at hand. If you accept powers and accept that a power's identity is determined by what it is a power for, then it is false that what happens next could have been other than it is. At any moment the powers have it in them to make the next moment what it is. This is so even if some powers manifest themselves spontaneously. A radium atom's decaying when it does is just one more node in a colossal dispositional matrix, one more contributing factor to the evolution of the whole.

7.5 Necessity and Contingency

Is a conception of the universe as an evolving dispositional matrix at odds with physics and with ordinary experience? Physics appears to mandate a chancy universe. Ordinary experience might be thought to reveal a universe rife with accident and contingency.

Whether an occurrence is contingent, however, is not something you could discover by casual inspection of the occurrence or by envisioning alternative universes. Philosophers who blithely announce that one or another truth is contingent owe themselves and the rest of us an explanation, especially when the truth's being contingent plays a role in an argument. Neither contingencies nor necessities come for free (see Martin 1997, 2008: 65).

You might be with me in doubting that a conception of the universe as a locked in dispositional matrix is at odds with our ordinary experience of the universe. But what of physics? What of ineliminable indeterminacy?

Consider the decay of a radium atom into an atom of radon accompanied by an alpha particle. The decay is flatly indeterministic, or so physics tells us. There is a definite fixed probability that the atom will decay over a certain period of time, but, when the atom decays, it does so spontaneously. Its decaying is not due to some further factor, some invisible trigger, some hidden

variable. Its decay is uncaused. If physics is right, such spontaneous occurrences are widespread. You might think of spontaneous occurrences as one, and perhaps the only, source of honest contingency. If the atom decays spontaneously, it is contingent that it decays when it does.

Return to the idea that the universe is a continuously evolving dispositional matrix. As originally depicted, this matrix was rigidly deterministic. Now sprinkle in, here and there, spontaneous occurrences. When you do this you propagate contingencies throughout the system. Notice, however, that none of this introduces any sort of looseness where causation is concerned. Causal truths are made true by the manifestings of reciprocal dispositions, and these are inevitable given the total dispositional setup at any given time.

Spontaneity is a matter of dispositions requiring no reciprocal partner for their manifestation. When a radium atom decays, nothing causes it to decay. Even so the atom's decaying is a manifestation that, together with various reciprocal partners issues in new manifestations that unfold as they do because they are as they are.

7.6 Historical Interlude

Earlier, I characterized the idea that the universe is a dispositional matrix as Aristotelian. The development of Aristotelianism was the development of a conception of the universe as locally self-governing. Objects do, or would do, what they do because the objects are as they are. There is no separating what an object—an electron, a horse, a black hole—*is* from what it *does* or would do in concert with companion objects. Objects are the objects they are owing to their qualities, and these equip them with powers or dispositionalities. The universe evolves of its own accord.

Contrast this picture of the universe with one according to which powerless objects are governed by laws of nature. You have the objects and you have principles that govern their behavior. What the objects do or would do depends, not on their natures and on the natures of their companions, but on the laws. Or, if you like, what the objects do depends only indirectly on their natures: objects fall under the laws they do because they have the natures they have, but the real work is done by the laws.

What is the source of this conception of the universe as law-governed? Consider the situation from the point of view of the medieval Church. God is omnipotent. God could do anything consistent with logic. This includes God's having the power to create endless alternative universes, universes in which

things behave very differently from the way they behave in our universe. God created the actual universe because it was the best option from an infinitude of options—why else?

Occasionalism, according to which God is the sole efficient cause, had influential medieval defenders, both Islamic and Christian, and the position described here is close to that of Aquinas (see Marenbon 2009). A view of this kind does not sit well with a conception of the universe as inevitable and self-governing. If a tomato does what it does because it is as it is, once God creates a tomato, miraculous intervention aside, God loses control of it. The difficulty can be overcome by removing the powers from the objects and relocating them in God. Now objects do what they do, not because they are as they are, but because God so decrees. Laws are principles on which God's will plays out in the created universe.

One notable feature of this move is that it makes laws external to what they govern. In creating the universe, God must create the objects and, in addition, establish the laws. The laws could have been otherwise had it so pleased God.

This is the conception of laws that eventually emerged in the hands of Descartes and his contemporaries in the seventeenth century and the conception embraced by Newton.

> That complex sequence of events which we have come to refer to as the scientific revolution brought about radical changes not merely in the content of the explanations accepted but also in the forms of explanation considered appropriate. The idea that one of the main aims—perhaps the main aim—of a natural philosopher should be the discovery of the laws governing the natural world emerged clearly for the first time during the seventeenth century. (Milton 1998: 680)

For Newton, space is something like God's extension, space is filled by God, who is literally everywhere exercising control over bodies moving and at rest (for extensive discussion see Grant 1981; Milton 1998; Shein 2019).

Now fast-forward to the twentieth century. God is no longer in the scientific picture leaving, as it were, a power vacuum. You might have thought this would have moved philosophers to reclaim powers for the objects and issued in a return to the Aristotelian picture of a self-governing universe. It did not. By then, the practice of regarding laws as responsible for, governing, the behavior of objects was too deeply entrenched. The laws remained. But without God to enforce them, in what sense could laws be said to govern? If you start with God's efficacious decrees and subtract God, what is left? Hume

saw the difficulty, regarding laws of nature as nothing more than true universal generalizations. Such laws would in no sense govern.

Armstrong reintroduces a measure of governance, but retains the thought that laws are contingent and something in addition to what they govern. If it is a law that the *A*s necessitate the *B*s, this is not because the *A*s and the *B*s are as they are. Laws are ontological add-ons. As noted earlier, laws, thus conceived, would entail Humean universal generalizations: if the *A*s necessitate the *B*s, whenever you have an *A* you have a *B*, and that looks problematic. An *A* can occur without an occurrence of *B* when some third factor, *C*, comes calling.

But if laws are not what Armstrong thinks they are, how could they govern? Marc Lange (2009) explicates laws as true counterfactuals, presumably with contrary-to-the-fact facts as truthmakers. For me at least, an appeal to contrary-to-the-fact facts is a bridge too far. (Alternative universes, the presumed venues for such facts will be canvassed in Chapter 10.)

7.7 Laws, Powers, Causation

If nothing else, I hope this brief excursion into the history of the invention of laws of nature brings out the oddity of attempts to explicate powers by reference to laws. Laws came on the scene as replacements for powers. Once powers are restored, the idea that laws govern the behavior of objects loses traction. Does this mean that there really are no laws?

In Chapter 3, I suggested that you might think of laws in the way scientists apparently think of them, not as conniving occupants of the universe, but as equations, formulae, principles reflecting objects' natures. You could think of Newton's laws of motion, for instance, as providing an indirect account of the antics of bodies in space by distilling the contribution mass makes to the behavior of massive objects. Every object exerts a force on every other object owing to the objects' respective masses. This means that the actual behavior of bodies in space is going to be the result of continuous interactions among bodies exerting reciprocal gravitational forces on one another. And because these bodies have properties in addition to mass, their observed behavior will be affected by factors other than their masses.

The reinstatement of powers and a return to an Aristotelian conception of a self-governing universe would provide a way to understand how all this might work. Objects' properties, their qualities, equip those objects with assorted dispositionalities. There is no separating what something is and what it does or would do in the company of other somethings. Interactions

among objects are mutual manifestations of reciprocal disposition partners. A particular instance of the manifestation of reciprocal dispositions, a causing, is a symmetrical, continuous affair. This is the causal nexus, this is where the action is. Talk of causes and effects is made true by the manifesting of reciprocal dispositions.

If a given disposition is the disposition it is because of how it would manifest itself as it does with particular kinds of reciprocal disposition partner, then, if you have *these* dispositions in *these* circumstances, you have *these* manifestations. Dispositional systems evolve gaplessly. Recasting causation in this light promises to illuminate the nature of the causal nexus and to provide a way of understanding what it is for something to be brought about.

This, really, is nothing more than a consequence of the fact, mentioned at the outset, that the identity of a power or disposition depends on what it is a disposition *for* with particular kinds of reciprocal disposition partner. Take your pen's cylindricality. By virtue of being cylindrical, the pen would roll across the desk, would cast a shadow of a particular shape on the desk's surface, would make an elongated concave impression if pressed into a lump of clay, would feel cylindrical, would look cylindrical, and perhaps, to a bat, would sound cylindrical.

If you have the objects disposed as they are and duly arranged, you have the manifestations. The relation of dispositions to their manifestations with particular sorts of reciprocal disposition partner is internal: you could not have *these* dispositions, distributed in *this* way, without *these* manifestations. If causing is the manifesting of dispositions, then causal relations are internal, utterly necessary, utterly deterministic.

To be sure, whenever you have a case of dispositions manifesting themselves in a particular way, it might be possible to introduce something that would result in a different kind of manifestation. If you have this array, you have this manifestation. If you add additional factors, however, if you coat the desk with glue, for instance, you have a new array. And, depending on its character, you could have a different manifestation. If you wrap a fragile vase in bubble wrap, it might no longer shatter when dropped onto a hard surface. Were you to lace your tea with a certain chemical, the sugar you add would fail to dissolve. In the absence of a 'that's all' clause, there is no guarantee that the presence of a particular collection of dispositions will yield a particular kind of manifestation.

Cases of this kind have led Stephen Mumford and Rani Lill Anjum to introduce a *sui generis* 'dispositional modality' (Mumford and Anjum 2011). Dispositions incline without necessitating. Cylindricality endows your pen

with a tendency to roll, sugar has a tendency to dissolve in hot tea, a fragile vase has a tendency to shatter when dropped on a hard surface.

The introduction of a special dispositional modality would make causal production unintelligible, but in any case it appears to be predicated on a misunderstanding. How a disposition would manifest itself hinges on the reciprocal dispositions in play. When you introduce glue, or bubble wrap, or a particular chemical, you rejigger the dispositional setup, thereby altering the manifestations. Your pen is disposed to manifest itself in one way owing to its cylindricality with one collection of reciprocal partners and in another way with a different collection.

In such cases, talk of interfering, or blocking, or inhibiting, talk of antidotes, is perspectival in the way talk of a struck match as *the* cause of a fire is perspectival. Any actual fire would be a manifestation of a complex dispositional array in which the lit match is but one of many contributing factors. Given your interests in the case, assessing culpability, for instance, you might select one or another of these factors, the burning match, as especially noteworthy. In another case, your attention might be drawn to the presence of oxygen or dry tender.

Similarly, what you might describe as a blocker, a patch of glue, for instance, could just as easily be seen as a facilitator were your aim to anchor the pen to the desk. What you have in every case are dispositions manifesting themselves as they must given that they are the dispositions they are, sometimes in ways we applaud, sometimes otherwise. When a mechanism, your refrigerator, for instance, malfunctions, it fails to do what it was designed to do, but considered simply as a complex dispositional setup, it is doing exactly what it must.

7.8 Absent Causes

Before concluding, I propose to reflect briefly on the efficacy of absences or privations. These might be thought to pose difficulties for a disposition-based account of causation.

Imagine that your banana plant dies because the neighbor who promised to water it while you were on holiday in Des Moines neglected to do so. The plant died owing to your neighbor's *not* acting as promised. Your neighbor's failure to act ensured that the plant *lacked* water. What killed the plant? Your neighbor's inaction, an absence that led to a lack of water, a privation. Does this mean that absences, lacks, and privations are powerful? Put the plant together with a lack of water and the manifestation is a wilted plant.

Much, probably too much, has been written about the causal efficacy of lacks, privations, and absences, but the account of dispositionality on the table provides the resources to make sense of ordinary talk of absences as causes without requiring that absences are themselves powerful or efficacious. Manifestations of a dispositional system that includes the plant, the soil in which it is rooted, and water differ from manifestations of a dispositional system that includes only the plant and the soil. What you have in these cases are different kinds of dispositional setup ensuring different kinds of reciprocal manifestation. You can describe one of these systems by mentioning the absence of water, but this is a practical convenience, a reflection of your or your audience's interests. If work is done, it is done by whatever dispositions are at hand.

In the case of absences described as causes, as in the case of talk of preventers, blockers, inhibitors, the question to ask is what the truthmakers might be for the respective judgments. The truthmaker for 'the glue prevented the pen from rolling' is a particular dispositional setup one manifestation of which is an immobile pen. The truthmaker for 'a lack of water killed the plant' is a dispositional setup that includes a plant rooted in dry soil.

Discussions of causation have been plagued by a slavish devotion to everyday causal locutions, which, after all, serve a variety of functions, together with an absence (!) of curiosity concerning the nature of truthmakers for those locutions. When you couple this with an unrelenting Humean outlook that pegs causation to laws expressing universal generalizations, talk of absences as causes, talk of preventers and inhibitors, makes perfect sense.

Except that it does not, as becomes clear when you recast the discussion in terms of the manifesting of powers or dispositions.

If I have accomplished nothing else by these remarks, I hope at least to have persuaded you that the introduction of dispositionality is game changing. At least it is so long as you are happy to accept a conception of the universe as home to distinct interacting objects. If what we regard as objects, particles, for instance, and distinguishable complexes made up of particles, turned out to be modes, perhaps modifications of fields or spacetime, matters would look very different. The topic is one to which I shall return in Chapter 12.

8

Emergence and Downward Causation

> We encounter in Aristotle a statement of the main reason why the mechanistic interpretation of the world was unacceptable to him and to the majority of naturalists and philosophers of modern times. Causality or necessity, as he calls the principle upheld by Democritus, and chance alone cannot give a reasonable explanation of the harmony of the world, especially of the organic world, nor can they account for the undeniable finalism of living processes.
>
> Montalenti 1974: 7

8.0 Wholes

In earlier chapters, I advanced a conception of substances and properties according to which substances must be simple: substances lack substantial parts, parts that are themselves substances. Substance and property are correlative categories. Substances are property bearers, properties are ways substances are, qualitative modifications of substances, modes. One consequence of such a view is that, if ordinary objects are made up of substances, they are not themselves substances, they could not themselves be property bearers, so complex wholes would not have properties.

Initially, this sounds shocking, but it is important to see what is and what is not being proposed. The idea is not that ordinary objects have an attenuated, second-class sort of reality, or that they lack qualities or powers. Qualities and powers of complex objects are what fall out when you combine substantial parts in the right ways, the right ways often being exceedingly complex, temporally extended, intensely interactive affairs.

I admit that I am using 'property' in a proprietary sense. I admit as well that in our everyday and scientific give and take with the universe we unselfconsciously ascribe properties to complex objects. When the aim is to arrive at an ontological assay of what there is, however, it would be a mistake to move directly from terms useful, even indispensable, in negotiating the manifest image to decisive ontological conclusions. My reluctance to ascribe properties

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to complex objects stems from a conviction that what we would commonly regard as properties of complex objects are Episcopalian properties, properties-by-courtesy, quasi-properties, resolvable into objects' propertied parts duly interactively organized.

I have already, in Chapters 3 and 5, offered reasons to think that this is so, and I shall not test your patience by rehearsing those reasons here. In this chapter and the next, I address two somewhat different ways of understanding complexes and their characteristics. The first of these, the subject of this chapter, appeals to 'emergent' properties of complex wholes, properties-with-a-capital-*P*, that could only be possessed by the wholes. Emergent properties might be thought of as a source of 'downward', whole-to-part causal influence. In Chapter 9, I turn to hylomorphism, a rival ontology with roots in Aristotle, some varieties of which appear to embrace something in the neighborhood of emergence and top-down, whole-to-part causation.

Before I begin, two caveats are in order. These stem from a conviction that physics gives us our best assessment of the nature of the truthmakers for truths that have truthmakers, together with the recognition that physics is far from complete and indeed might never be complete. A pair of theories at the heart of physics, quantum mechanics and general relativity, have proved remarkably successful. What remains unclear, however, is how these theories could be combined so as to yield a unified picture of the nature of what there is.

Relativity aside, competing interpretations of quantum mechanics abound, competing attempts to say what the universe would be like were the theory true. That being so, you could accept the inevitability of a substance–property ontology and remain in the dark as to what the substances and properties are. Are the substances particles? Fields? Particles and fields? Or is there just a single substance, spacetime or the universe as a whole? Undoubtedly there are hosts of other options I am not equipped to understand.

My first caveat, then, concerns the numerosity of substances. Talk of wholes made up of substantial parts would have purchase only in a pluralistic universe with multiple substances. And only if there were wholes comprising substantial parts could there be top-down causation or anything resembling emergence as it is commonly understood. For this reason I shall look at the topics in play assuming first a corpuscular universe of particles, then move to a universe comprising a single substance. I shall leave it to you the reader to work out the implications for intermediate universes, 'mixed' universes, or universes with a small number of substances, the fields, for instance.

My second caveat concerns empirical evidence for emergence. I am sceptical that this evidence supports anything deserving the label, but I admit that

I could easily be wrong. If I am wrong, if complex objects could have genuinely emergent properties, and if these properties were capable of whole-to-part, top-down causal influence, I would be obliged either to give up the idea that only substances could be property bearers or to find some way of showing that what appear to be complexes really are not, that, in some cases, when you put parts together in the right way, they cease to be parts, a thought that calls to mind certain interpretations of Aristotle.

If I am right about substances and properties, emergent properties would be properties of emergent substances, ways emergent substances are. Whatever its shortcomings, my insistence that only simple, noncomplex substances could be property bearers helps focus the discussion of emergence. Emergent wholes are meant to be 'prior' to their parts (another idea with an Aristotelian flavor). Rather than carry this thought along in the discussion, however, I shall set substances to one side and concentrate, as most authors do, on emergent properties, with the understanding that there is reason to think that, if there are emergent properties, these would be properties of emergent substances.

My attempts to sort out emergence and its sibling, downward causation, begin, in the section to follow, with a discussion of downward causation. As will become evident, I am not altogether comfortable with these topics. I find them elusive and difficult to pin down. What you have before you is my best effort to make clear what might not admit of much in the way of clarity.

A final caveat. Lawyers are advised never to ask a question unless they already know the answer. In the case of philosophy, definitive answers are rarely available. The risk lies in addressing questions pertaining to subjects that are not well understood. Thus it is with considerable trepidation that I take up the topic of downward causation. I admit at the outset that I have no very clear idea what downward causation is supposed to be. For this reason it is more than possible that some proponents of downward causation will find my observations off the mark.

Perhaps, however, I can at least advance the conversation ever so slightly toward a clearer conception of what downward causation is *not*. This will involve a positive discussion of the metaphysics of efficient causation, together with the suggestion that appeals to downward causation—and emergence—too often owe whatever plausibility they might have to inadequate descriptions of the ingredients of complex systems and interactions of these with one another and with factors external to the systems they constitute.

8.1 Species of Downward Causation

Psychologist Donald T. Campbell is commonly credited with the introduction of the label 'downward causation'. According to Campbell, downward causation occurs when 'all processes at the lower levels of a hierarchy are restrained by and act in conformity to the laws of the higher levels' (Campbell 1974: 180). Campbell's levels are meant to reflect the 'hierarchical organisation in biological systems. The organisational levels of *molecule*, *cell*, *tissue*, *organ*, *organism*, *breeding population*, *species*, and in some instances *social system*, and perhaps even *ecosystem*' (179).

Such a conception of levels is broadly mereological: lower-level items are component parts of higher-level 'systems'. Downward causation would occur when encompassing wholes causally influence the behavior of their parts. The result is a two-way, lower- to higher-level and higher- to lower-level, dependence. Wholes made up of, hence dependent on, assemblages of parts, causally constrain the parts' behavior.

Roger Sperry spells this out in the case of 'subjective mental phenomena':

> Subjective mental phenomena are conceived to influence and govern the flow of nerve impulse traffic by virtue of their encompassing emergent properties. Individual nerve impulses and other excitatory components of a cerebral activity pattern are simply carried along or shunted this way or that by the prevailing overall dynamics of the whole active process (in principle—just as drops of water are carried along by a local eddy in a stream or the way the molecules or atoms of a wheel are carried along when it rolls down the hill, regardless of whether the individual molecules and atoms happen to like it or not). (Sperry 1969: 534)

A somewhat different conception of levels is associated with work in the philosophy of mind and the philosophy of biology, and in particular with nonreductive physicalism. On this conception, mental properties, for instance, are taken to be higher-level properties of objects dependent on but distinct from lower-level physical properties of those same objects. Your brain, or some portion of your brain, might, by virtue of possessing a physical property, *P*, possess a distinct higher-level mental property, *M*. (*M* supervenes on *P*, *P* is *M*'s realizer.) Here, downward causation might involve *M*'s causally influencing, not *P*, *M*'s realizer, but some other lower-level physical state, your brain's being P^*.

Cases of this second sort were addressed in Chapter 4. My focus now will be on cases of the first sort, cases in which wholes are taken to interact causally with their parts. In my experience, when non-philosophers, scientists, for instance, speak of downward causation, they are thinking of whole-to-part causation, not the kinds of case targeted by nonreductive physicalists.

A third species of what might be called downward is spelled out by Michael Esfeld in a discussion of the metaphysics of quantum physics (Esfeld 2016, 2020). Esfeld characterizes classical physics as explaining the behavior of particles by endowing them with intrinsic properties that are responsible for their interactions with other particles. Classical physics is, in this sense, Aristotelian. Once quantum physics comes on the scene, however, this Aristotelian picture falls apart because it would require what Einstein regarded as spooky action at a distance. An occurrence here would have instantaneous effects elsewhere.

Esfeld suggests that the difficulty could be overcome by rejecting the Aristotelian picture. The particles do not influence one another, but are influenced by a property of the whole collection of particles. A change in the velocity of a particle is not brought about by other particles. Rather, a property of the whole collection determines its evolution over time. Particles do not interact in spooky ways. They do not interact at all.

This way of thinking about the evolution of the distribution of particles would work for classical physics as well. The difference between classical and quantum physics is not a difference in ontology, but a difference in the equations taken to characterize the evolution of the whole.

On one reading, Esfeld's position comes close to one to be discussed in Chapter 12: the whole does not exert anything like a downward causal influence of parts that make it up. The whole simply evolves. Because, on that reading, there is no question of downward causation, I shall postpone discussing it here, and return to it in Chapter 12.

8.2 Emergence

Accounts of downward causation are invariably associated with discussions of emergence. Emergent entities produce changes in entities from which the emergent entities emerge. Proponents and opponents of emergence appear to agree that, if entities, properties, for instance, emerge, they exert a downward, whole-to-part, causal influence. Philosophers who doubt the existence, or even coherence, of downward causation, doubt emergence. Those who

embrace emergence do so in part to account for apparent instances of downward causation. The two notions, emergence and downward causation, would seem to stand or fall together.

Although the literature on both emergence and downward causation is vast, there is little agreement on what emergence and downward causation are. Philosophers disagree on many things, of course. Philosophers disagree profoundly on the nature of ordinary efficient causation, for instance. But disagreements over emergence and downward causation are more unsettling. Few scientists or philosophers doubt that causation occurs. Apparently uncontroversial examples of causal processes are ready to hand anchoring competing accounts of causation purporting to illuminate their nature.

In the case of emergence, in contrast, competing accounts often appear to be accounts of different phenomena. For many, particularly in the sciences, emergence pertains to prediction and explanation. In the hands of philosophers, emergence of this kind would be spelled out deductively: the *A*s emerge from the *B*s when descriptions and explanations of *A*s cannot be deduced from, or at least predicted on the basis of, what is known about the *B*s taken individually.

Such epistemological characterizations leave the ontology untouched. Explanations offered by a chef for the success of a particular recipe are, almost certainly, not deducible from a description of the ingredients couched in the vocabulary of physics supplemented by laws governing the particles and forces. Although I could be wrong, this seems not by itself to make cakes or their culinary qualities emergent entities in any ontologically robust sense. The terminology is somewhat unsettled, but emergence thus characterized is sometimes called 'weak emergence'.

Mark Bedau offers a helpful characterization of a kind of weak emergence in terms of macrostates of complex systems being derivable from microstates 'only by simulation'.

> Given a system's initial condition and the sequence of all other external conditions, the system's microdynamic completely determines each successive microstate of the system. To simulate the system one iterates its microdynamic, given a contingent stream of external conditions as input. Since the macrostate *P* is a structural property constituted out of the system's microstates, the external conditions and the microdynamic completely determine whether *P* materialises at any stage in the simulation. By simulating the system in this way one can derive from the microdynamic plus the external conditions whether *P* obtains at any given time after the initial condition.

> What distinguishes a weakly emergent macrostate is that this sort of simulation is required to derive the macrostate's behavior from the system's microdynamic. (Bedau 1997: 378)

Given that the behavior of a weakly emergent system is wholly constrained by the behavior of components of the system from which it emerges (together with 'external conditions') there is no question of downward causation in such cases.

To the extent that Bedau's weak emergence is characterized by reference to derivability, it should be understood as a thesis about prediction and explanation: owing to the nature of things, the behavior of certain complex systems cannot, even in principle, be predicted or described solely on the basis of descriptions of features of the components of the complex systems they constitute and relations these bear to one another.

Weak emergence could be contrasted with 'strong emergence', an explicitly ontological thesis. The *A*s strongly emerge from the *B*s only if . . . ? Only if *what*? This is the sticking point. To be emergent, the *A*s would need to be something 'in addition to' the *B*s. At the very least, if the *A*s are emergent properties, then the *A*s must contribute causal powers to their possessors that outstrip those contributed by the *B*s, even the *B*s working in concert.

This is, at best, only part of the story. A tomato has the power to roll owing to its spherical shape. The tomato's parts, however, need not be spherical, need not themselves have the power to roll. Yet it does not seem that the tomato, or at least the tomato's shape, are, in any interesting sense, ontologically emergent. The tomato and its shape are just what you get when you put the tomato's parts together in a particular way. The tomato's shape is what emergentists would call a merely 'resultant' property of the tomato.

Sceptics about emergence think that every characteristic of a complex system is in this sense resultant. The complex systems of interest comprise many, many parts dynamically and interactively organized. In interacting, the parts affect one another, sometimes in dramatic ways. When you have all this, say the sceptics, you thereby have something, a complex system, that does indeed exhibit new kinds of characteristic that equip the system with powers not possessed by its individual parts. But these characteristics are nothing in addition to, nothing 'over and above' these parts with these properties interactively organized. Genuinely emergent properties would, it seems, be real additions to the complexes to which they belong.

Although I have been playing along with the idea that candidate emergent properties are properties of complexes, given my views on substances and

properties, I am using 'property' in an extended Episcopalian sense. Were a property genuinely emergent, it would turn out to be a genuine property.

It is not easy to find clear, uncontroversial examples of such properties. Some philosophers point to consciousness as emergent. Indeed David Chalmers has suggested that consciousness might afford the only clear case of a strongly emergent phenomenon (Chalmers 2006: 246).

The trouble is that it is difficult to get a grip on what the emergence of anything, including consciousness, would amount to. Philosophers typically characterize emergence negatively. If the *A*s emerge from the *B*s, *A*-truths are not deducible from *B*-truths; *A*s are not reducible to *B*s; laws governing the *A*s are not derivable from laws governing the *B*s. We know that, if you put the *B*s together in the right ways, you will get an *A*, but why this is so is opaque. The existence of an 'explanatory gap' in such cases is commonly regarded as one signature of an emergent phenomenon.

This makes it appear that emergence is simply a label for *whatever it is* that is responsible for the otherwise inexplicable occurrence of aspects of complex wholes we take to be dependent on parts that are themselves comparatively well understood. Galen Strawson exemplifies this attitude as does Bedau (Strawson 2008: 60–7; Bedeau 1997: 376–7).

Maybe this is too hasty, however. Maybe the key to an understanding of emergence lies in the possibility of downward causation. Suppose there are cases in which, as Campbell puts it, 'processes at the lower levels of a hierarchy are restrained by and act in conformity to the laws of the higher levels'. Were there cases, for instance, in which higher-level items exerted what Brian McLaughlin calls 'configurational forces' on items at lower levels, entities exerting these forces might plausibly be regarded as emergent. Such forces would be fundamental in the sense that they would be 'exerted only by certain types of configurations of particles and not by any types of pairs of particles' (McLaughlin 1992: 52). Such forces would presumably supplement gravitational and electromagnetic forces and the weak and strong forces that operate between particle pairs.

8.3 Properties

These ideas are sometimes spelled out in terms of the derivability of laws. Are laws governing complex, higher-level systems derivable from lower-level, more fundamental laws? Are higher-level laws perhaps special cases of laws at lower levels? You might follow Michael Friedman and picture the laws

governing interactions among the fundamental particles as making up an axiom system, *L* (Friedman 1974). The laws function as independent axioms in the sense that no law could be derived from the other laws. A law, *L′*, governing higher-level items would be fundamental were *L′* underivable from *L*. *L′* would govern cases of downward causation provided it, in effect, made the behavior of lower-level items, particles, say, dependent on higher-level particle 'configurations'. This sounds like Campbell.

Would downward causation of this kind require the 'violation' of fundamental laws governing individual particles? That would be a strange thought. *L′* would serve to explain the behavior of particles that would otherwise remain inexplicable, but this is so for any law. Particles are subject to various forces. A particle accelerating in a gravitational field that is simultaneously influenced by a strong electromagnetic force would not be violating laws governing gravitational forces. The laws work together to explain why particles behave as they do. The question at hand is whether new *L′* style fundamental laws are required to account for the behavior of the constituents of complex wholes, and that is an empirical matter.

Once powers are on the scene, attention shifts from statements and deductive relations to ontology. You have the particles with their various powers and you have putatively emergent powers, powers belonging presumably to organized collections of particles, powers of wholes capable of affecting members of the collections making them up.

In this context it is important to distinguish cases in which particles' behavior is affected by their membership in collections from cases in which a property of a collection as a whole affects the collection's members. Atoms and molecules making up complex molecular systems can, and typically do, affect, and even modify, one another in myriad ways. Particles in combination unquestionably behave differently than particles individually or in pairs. Interactions of this kind, however, do not seem to be instances of downward causation, they do not seem to be cases in which wholes, which after all include the parts, exercise causal influence over their parts.

This is one issue. A second is like unto it. What exactly are 'properties of wholes'? You have the parts and their properties interactively organized into wholes. Do you have, in addition, properties of the wholes? In this chapter I have been finessing this topic, thinking with the learned, speaking with the vulgar, but, given its importance in the present context, let me briefly remind you of themes introduced in Chapter 3.

Start with the thought that many predicates apply truly to wholes but not to their parts. If you arrange the pieces of a puzzle together the result can be

rectangular even though no individual piece is rectangular. So it is the assembled puzzle that is rectangular. But is the puzzle's rectangularity a property of a distinct entity, the puzzle? Or is the puzzle simply these pieces duly arranged, not some further property-bearing entity?

The question will seem peculiar if you are used to reading properties off predicates. But if you are ontologically serious about properties, you will want to know, in the case of any property, what its bearer is. And, in considering properties of wholes, the question is whether complexes are candidate property bearers.

The answer to this question is by no means obvious. Granted, all sorts of truths hold of complexes that do not hold of their parts: the puzzle, not its component pieces, is rectangular. What is much less clear is whether these truths are made true by properties possessed by the complexes. If you are not gripped by this issue, if you think the answer really is just obvious, that there is no difficulty in the thought that complex entities bear properties, consider yourself lucky.

To reiterate: the question is not whether there are truths about wholes not applicable to, or derivable from truths about their parts, nor whether there are legions of predicates that apply truly to wholes but not to their parts. Rather, the question is whether these predicates designate properties borne by the wholes that somehow outstrip the propertied parts organized as they are.

This is not a frivolous terminological issue: what one person calls properties of a complex whole, another calls quasi-properties. If wholes had characteristics not resolvable into interactive arrangements of their propertied parts, that would be ontologically significant, especially if properties are power-conferring. If a complex object's spherical shape, for instance, were a property of the complex in addition to the interactive dynamic arrangement of propertied parts that make up the complex at any moment of its existence, the relation of this property to the interactive arrangement would require attention.

Consider an ordinary billiard ball. Could God have taken parts indiscernible from those making up the ball and arranged them interactively exactly as they are arranged without making a spherical whole, a whole with the power to roll? If not, why not? (A bad answer: God could have made the laws different, leading to identical configurations of parts yielding distinct wholes. The pertinent question concerns whether God *could* have done this.)

Once you consider all the parts of complex objects interactively organized, you might think that you have all you need to serve as truthmakers for the application of predicates to those objects. The wholes just are the parts,

massively interactively organized, and characteristics of the wholes are what you have when the parts are so organized. Although identity and persistence conditions on certain kinds of whole might allow for the coming and going of parts, at any given time a whole is constituted by a particular interactive configuration of parts, and these, together perhaps with outside factors, determine its characteristics at that time.

Please do not imagine that this would prevent you from ascribing new qualities and powers to wholes that are absent in their parts. A tomato is red, juicy, and would roll across a table, although none of the tomato's parts are any of these ways.

Were something like this right, or nearly right, for the tomato and for other ordinary objects, characteristics of such objects could not be said to exert downward, whole-to-part causal influence. This is because characteristics of wholes would not be separable from, not something in addition to, interactive arrangements of their propertied parts. Parts of the whole might, and probably do, interact causally with one another and with entities outside the whole, and the whole could undergo vast changes as a result of these interactions. The same parts differently organized might constitute very different kinds of whole. But it would be highly misleading to imagine that the wholes themselves could somehow act independently of the parts that make them up.

None of this implies reduction or elimination. There is almost certainly no prospect of paraphrasing talk of wholes relying exclusively on predicates applicable to their parts (or these plus their arrangements), no prospect of deducing or 'deriving' truths about wholes from truths pertaining to their parts, and assuredly no point in attempting to replace explanations of the behavior of wholes with explanations adverting only to their parts. The mistake would be to take these linguistic and epistemological points in an ontological direction, to assume that irreducibility implies ontological distinctness.

The reasoning in play does not stem from worries about the 'causal closure' of the physical universe or to the 'exclusion problem' that dog hierarchical conceptions of reality discussed in earlier chapters. The motivation, rather, has been to make sense of the relation characteristics of complex wholes bear to their interactively organized parts. The introduction of higher-level entities and properties is, on the conception under consideration, gratuitous and ontologically pernicious, a result of mistaking shadows cast by taxonomies for ontologically prominent features of the universe.

I have insisted that this does not mean that characteristics of complex objects are unreal or nonexistent. Characteristics of complexes are perfectly

real, no less so than characteristics of their parts. It is true that complex objects have the powers and qualities we ascribe to them in the course of explaining why they behave, or would behave, as they do. What you learn when you come to understand the composition of complex objects is not that their characteristics are illusory or impotent; you learn what those characteristics at bottom are, what they amount to.

These points can be difficult to appreciate because they are too often presented in a way that dramatically underdescribes arrangements that make up complex wholes. The arrangements are presented as aggregates of atoms or molecules the properties of which could not possibly add up to the characteristics of the wholes of which they are parts. But the complex wholes at issue, organic molecules, for instance, or rabbits, or conscious human beings, far from being mere aggregates, are highly interactive dynamic affairs, the parts of which can undergo significant modifications in the course of working together with one another. None of this would happen were the parts not so arranged. But from the fact that the parts behave very differently in these arrangements than in isolation or in pairs, does not license the idea that the arrangement exerts a downward 'configurational force' on its parts.

8.4 Wholes without Parts

Discussions of emergence and downward causation are most at home in a corpuscular universe, a universe that includes interactive arrangements of particles. Given our current state of knowledge, this is not the only possibility. For all we know, the universe might comprise fields, or a single unified field, or space itself, or spacetime. In such a universe, fields, or space, or spacetime would play the substance role. What we regard as particles and collections of particles would be modifications of, or disturbances in, fields, eddies, local thickenings of space, wrinkles in spacetime, modes, not substances. This is the universe as depicted by Spinoza and arguably, in the case of the material universe, by Descartes, and perhaps by Locke and Newton as well. It evokes the universe of General Relativity.

As far as anyone knows, these are live options deserving consideration as serious possibilities. Their implications for questions about emergence and downward causation are scarcely obvious, however. Suppose, for instance, that what we commonly regard as complex wholes turned out to be multi-faceted disturbances in fields.

Such wholes could be described as having parts, but the parts would themselves be wave-like abstract particulars, modes. These 'parts' would not make up wholes as particles might be thought to make up a rabbit or a tomato. Their relation to wholes would be analogous to the relation regions of space bear to space. Space conceived of substantively would not be made up of spatial points or regions in the way a mosaic is made up of tiles. Whereas complex wholes made up of parts that are themselves substances depend on those parts, were space a substance, its parts—spatial points or regions—would depend on it. Parts of complex objects, and indeed the objects themselves, would turn out to be aspects or modifications of what is already there.

If you want a model, think of Sperry's 'local eddy in a stream' discussed in § 8.1.

Sperry deploys the example as an instance of top-down causation in which 'drops of water are carried along' by the eddy 'regardless of whether the individual molecules and atoms happen to like it or not'. Jaegwon Kim demurs: 'an eddy is there because the individual water molecules constituting it are swirling around in a circular motion; in fact, an eddy is nothing but these water molecules engaged in this pattern of motion' (Kim 2000: 313).

What if water were not a collection of particles but had the seamless character of a field. The eddy would be a local turbulence in the field. In this case, there would be no particles to be 'carried along', only a succession of disturbances, the motion of which would in some respects resemble the undulatory motion of a shiver running down your spine.

Parts, or better, portions, of the eddy would not make it up as water molecules make up Sperry's eddy, so there would be no question of the eddy's exerting downward causal influence on its parts. The eddy's parts would be better regarded as aspects of the eddy, ways it is, just as the crest and trough of a wave might be thought of as aspects of the wave. Were the eddy itself an aspect of the field, a dynamic way the field is, aspects of the eddy, ways the eddy is, would be, at bottom, aspects of the field considered apart from the eddy. Emergence in a seamless universe would have to be different in kind from emergence as ordinarily conceived.

8.5 Campbell's Panpsychism

Philosophers (and scores of non-philosophers) have been attracted to emergence because they are convinced there is no hope of finding conscious qualities in purely physical systems. Conscious qualities are presumed to be

altogether unlike anything studied in the physical sciences. But in that case, how is it that qualitied experiences come to be on the scene as they undoubtedly are? The physical things must have it in them to yield qualitied conscious experiences once they are put together in the right way. Given their nature, certain complex arrangements of nonconscious particles can give rise to conscious experiences: consciousness emerges.

Emergence, thus conceived, would have no place in a universe of fields, a universe lacking parts waiting to be put together in the right way. But, in that case, how could conscious experiential qualities ever come about? One option would be to abandon the emergentist assumption that the physical things lack conscious qualities. The qualities do not need to emerge because they were there all along. This is the line taken by advocates of panpsychism.

Panpsychism, which has been around in various guises since ancient times, is currently enjoying a modest revival (see Strawson 2008 and Goff et al. 2017 for representative discussions). Consciousness is everywhere, not in the sense that there is a World Soul, but in the sense that consciousness, perhaps in some attenuated form, is already present in matter. Galen Strawson speaks for many in arguing that, just as you could not hope to produce something extended from parts, none of which were extended, so you could not produce conscious experiences from parts, the particles, presumably, wholly lacking in consciousness (Strawson 2008: 60–7). Consciousness must be in on the ground floor.

This is another part–whole model and, in a seamless universe, there are no parts, so no wholes, conscious or otherwise, made up of parts, conscious or otherwise. Like emergence, panpsychism, as it is conventionally expounded, would need to be revised in order to fit such a universe.

Maybe that would not be a bad thing. Unlike emergence, panpsychism might be more naturally suited to a seamless universe. Keith, not Donald, Campbell, in the course of spelling out the ontological implications in a move from particles to fields, mentions, without endorsing, an alternative to conventional panpsychism.

In a universe of fields, particles and ordinary objects could be seen as spatially and temporally coinciding, compresent, regions of field-excitation, local eddies. The idea has put in numerous appearances already, so I shall not dwell on it here, but instead consider Campbell's reflections on the place of consciousness in a universe of fields (see Campbell 1990: §§ 7.2–7.3). Campbell's fields are 'tropes', not substances as I have characterized them. This is an important difference, but has no bearing on the issue at hand, so I shall set it aside for the time being.

There are, Campbell suggests, at least three ways to accommodate conscious experiences in a universe of fields. First, materialism: consciousness might be simply an extraordinary, *sui generis* material phenomenon. When local conditions are right, they constitute conscious experiences. For reasons that lead others to emergence, however, Campbell is pessimistic about the prospects of anyone's finding a plausible account of how conscious states could possibly be identified with material states.

The alternative is to embrace a form of dualism. Thus, the second option, consciousness might be emergent. When the material fields interact in the right way, they produce consciousness, an entirely new phenomenon, something 'in addition to' material phenomena, something that brings with it new causal powers. Consciousness would be a new kind of eddy in an existing field. This is close to what conventional emergentists have in mind, but tailored to a universe of fields, not particles.

Campbell's third option brings us to panpsychism. Suppose what we regard as objects, including the particles, are spatially and temporally coinciding disturbances in fields. Now suppose there were an additional, non-physical consciousness field. Fields pervade spacetime, so a consciousness field would cohabit with all the others, it would be present everywhere: panpsychism!

This need not be to embrace the idea that the universe as a whole undergoes conscious experiences, however. Experiences could be local regions of excitation. All that is required for the existence of a lone electron, or a pebble, or a star is the occurrence of an interactive pattern of excitations in the physical fields occurring in a particular region. In those regions, the consciousness field is quiescent. In other regions, however, those coinciding with conscious agents, the consciousness field is invigorated.

Campbell does not embrace this approach to conscious experiences, but offers it as an empirical possibility, one to be considered alongside others. In many respects, Campbell's panpsychism is less fraught than conventional panpsychism. The consciousness *field* is pervasive, but not conscious *experiences*. An unattached electron occupies a region of spacetime that coincides with a region of the consciousness field, but a quiescent region: there is nothing it is like to be an electron. You, in contrast, or your brain, occupy an energized region of the consciousness field. Which material beings are conscious in this way, how far consciousness extends, would be an empirical question.

Another advantage this species of panpsychism enjoys over conventional part-to-whole panpsychism is that it appears to avoid the 'grain problem', a

problem discussed by Sellars, for instance, and by Michel Lockwood (Sellars 1962; Lockwood 1989; see also Goff 2017: chapter 8). What exactly is the grain problem? Suppose conscious experiences were assembled from atomistic fragments of consciousness as depicted in conventional panpsychism. How could you get from granular fragments to the seamless character of conscious experiences? As Lockwood notes, the problem, if it is a problem, would not arise in a universe of fields, a nongranular seamless universe (Lockwood 1989: 237).

8.6 Efficient Causation

The point of this detour into panpsychism has not been to convince you to convert to panpsychism, but only to register the fact that many things change when you move from a corpuscular universe to a continuous universe of fields, or indeed any continuous universe.

The fate of familiar cases of efficient causation in a universe of this kind is unclear. If objects really were modifications of fields, if objects—particles, billiard balls, planets—were modes, these might affect one another causally, as waves interfere with one another.

Alternatively, causation might be reserved for interactions among the fields, an option that would not be available were the fields unified. In that case, what we take to be causal interactions could turn out to be dynamic expressions of the field itself. Were that so, efficient causation would belong to the manifest image. The physics of causal interactions among particles would resemble what we know already about what happens when your cursor's passing over an icon causes the appearance of a text box, although the analogy is in one respect unperspicuous. The relation between the cursor and the icon is not itself an instance of efficient causation, but both the behavior of the cursor and the behavior of the icon are effects of ordinary efficient causal processes working behind the scenes.

The suggestion on the table is that, if some such monistic picture turned out to be correct, we would be obliged to regard local instances of efficient causation as dynamic expressions of the nature of an underlying continuous something, the One. Objects, ordinary and otherwise, would be modes, properties not substances, properties dependent on the substance they modify. In that case, particles and the complexes they make up would be abstractions, aspects of the One, ways the One is, separable from the One in thought only, not in reality.

Were this how it is, talk of downward causation would lose its point. You could continue to describe and explain everyday phenomena in everyday ways, but the story issuing from physics would be one in which causation, downward causation or run-of-the mill efficient causation, would not figure.

Whether the universe is this way or some other way, whether there are many substances, or only a few, or just one, is a broadly empirical question, a point harped on in earlier chapters. When it comes to the nature of causation, considering the implications of a one-substance ontology, or an ontology that admits only a handful of substances (the fields), can flush out ontological presumptions otherwise likely to remain hidden. Exposed to the light of day, these presumptions can lose their undeserved air of inevitability, enabling us perhaps to move beyond the familiar platitudes that regiment our thoughts on ontological matters.

Questions about the status of efficient causation will surface again in Chapter 12. Meanwhile, it is worth reflecting on the difficulty of keeping monistic conceptions of the universe from asserting themselves. Whether the universe is pluralistic, whether it comprises a multitude of substances, or a few substances, or only a single substance, is not something to be decided in the pub by philosophers. The manifest image is certainly pluralistic. But the question is, what is the nature of whatever is responsible for the appearances, what might a completed physics look like?

If efficient causation becomes awkward once pluralism is abandoned, the status of causation would appear to be a hostage to fortune, a sobering thought given its evident indispensability in our everyday and scientific dealings with the universe. Before trying to convince you that all this talk about substances and properties has not been an utter waste of time, however, I propose, in the next chapter, to look briefly at hylomorphism, a rival ontology with an impressive pedigree.

Before turning to hylomorphism, I cannot resist calling your attention to a class of what would appear to be uncontroversially emergent phenomena.

8.7 Real Emergence

When particles interact in a collider or in the interior of a star so as to yield an entirely new kind of particle, you have something properly deserving to be called an emergent phenomenon. By ‘new’ here I mean either utterly new, as when something of a kind that never previously was comes into being, or simply new in the sense of being newly minted, as when an electron

momentarily erupts from the vacuum. Presumably, the makeup of the universe as it is now is very different from its makeup when the Big Bang occurred. Much of what there is at present emerged from the very early universe.

I recognize that this is not what most philosophers and scientists have in mind when they speak of emergence, but it strikes me as ironic that such cases have been largely ignored in discussions of the topic. They need not, of course, involve complexes or anything like top-down causation, but they are nevertheless stunningly interesting and ontologically remarkable. It would seem that the very early universe included capacities, powers to yield whatever now exists. What there is Emerged with a capital 'E'.

9
Hylomorphism

> Plato . . . taught that the essences are eternal prototypes, an ethereal aristocracy of ideals, laid up in heaven as patterns to be distantly imitated by the things that exist here below. Aristotle taught that the essence of a thing is its inner principle, its ontological soul which preserves and improves it, explains it, and makes it what it is, in contrast with the rest of its properties, which are merely accidental. Both of those philosophers, and most of their more official heirs for two thousand years, agreed that true essences are relatively few, that they are accessible only to reason, that they are good, that they are what things ought to be, that they act on things by luring or egging them forward, and that in so far as things fall short they not merely are wrongly constituted, they are unconstituted, intrinsically deficient and vague. This is the metaphysics of the dog show: that there is a sublime essential Poodlehood, for example, to which every poodle aspires and deserves a blue ribbon if he achieves it better than other poodles. In human society it has been, too often, the metaphysics of natural aristocracy and natural slaves and natural law, for it suggests if it does not entail that ontological experts can discern our one true Nature and decree what is proper and what is improper to it, and allot each to his caste according as he conforms or not.
>
> D. C. Williams 1954: 36

9.0 Learning from Our Betters

The previous chapter centered on emergence and downward causation. My suggestion there was that arguments for emergence and for downward causation were fueled by epistemological and taxonomic considerations with little or no bearing on ontology.

Were emergence simply the idea that truths about characteristics—qualities and powers—of complex wholes cannot be extracted from truths about characteristics of the parts, this would not make characteristics of wholes additions

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of being. Truths about wholes are rarely derivable, at least in the sense of being deducible, from truths about their parts. This is consistent with the idea that truthmakers for truths about the wholes are just the parts duly, and often interactively, organized.

If emergence is understood in terms of the nonderivability of laws governing complex systems from laws governing parts of those systems, the appropriate question is, what are the truthmakers for formulae and equations taken to express the laws? Were the universe corpuscular in nature, truthmakers for these formulae and equations would be objects' powers or dispositionalities. When these differ, as they can in the case of parts and wholes, the laws will differ. And, again, this brings with it scant ontological illumination.

These points are notes in a melody running through the book: metaphysics generally, and ontology especially, is a package deal. A conception of properties has important implications for conceptions of causation and conceptions of laws. The practice of assembling off the shelf components to advance a metaphysical thesis, then shuffling these so as to achieve some desired outcome, manifests a kind of ontological malfeasance inimical to serious metaphysics.

In this chapter I turn to hylomorphism, an ontology with a long and distinguished history. The subject is fitting because some versions of hylomorphism appear to endorse a robust form of emergence and top-down, whole-to-part causation. Although the universe of Aristotle, the father of hylomorphism, is an atomless universe of continuous stuffs inhospitable to emergence and whole-to-part causation, contemporary defenders of hylomorphism are generally happy to countenance a corpuscular universe.

A number of topics that will prove useful in thinking about hylomorphism were introduced in previous chapters. These include, in addition to emergence and downward causation, the account of substance in Chapter 3, the treatment of essences and universals in Chapter 4, and discussions of empowering qualities in Chapter 5. My hope is that these discussions hang together and are mutually supportive so as to provide an actual instance of a whole greater than its parts.

9.1 Hylomorphisms

According to Michael Rea, 'hylomorphism is on the rise in contemporary metaphysics' (Rea 2011: 342). Prominent philosophers, including Kit Fine (1999, 2008, 2010), Mark Johnston (2006), Katherine Koslicki (2008), Jeffrey

Brower (2010; Brower and Rea 2005), Anna Marmodoro (2013), Robert Koons (2014), Simon Evnine (2016), William Jaworski (2016), and Rea himself are among many who have advanced theses they characterize as species of hylomorphism. But what exactly *is* hylomorphism?

Hylomorphism is sometimes characterized as the view that ordinary objects comprise a pair of 'components': their 'matter', whatever makes them up, organized in a particular way, their 'form'. Were that all there were to it, hylomorphism would be philosophically unexceptionable and supremely uninteresting. Many proponents of hylomorphism take themselves to be advancing a much sturdier thesis, however. In some cases the attraction is driven by an interest in emergent top-down causal processes of the kind discussed in the previous chapter.

After a brief, unsystematic attempt to sort out Aristotle's position and some of its more recent incarnations, I speak to what appears to me to be a fundamental instability in Aristotle's ontology, and proceed to sketch an alternative picture. I admit at the outset that my understanding of the long history of hylomorphism is parochial, so what I have to say undoubtedly leaves versions of hylomorphism untouched—either because I am wrong about commitments I associate with particular strains of hylomorphism, or because my reservations concerning the plausibility of these commitments are naïve or unwarranted. Still, maybe my efforts will at least serve to sharpen the debate.

First, consider what philosophers who regard themselves as embracing some form of hylomorphism hope to accomplish. Aristotle was motivated by questions about change and questions about unity or oneness. These latter concerns are reflected in present-day hylomorphists' interest in providing a principled answer to Peter van Inwagen's special composition question: 'under what conditions do things add up to (make up, compose) *a* thing?' (van Inwagen 1993: 683; the question is discussed in detail in van Inwagen 1990; see also § 3.7). According to van Inwagen, composition occurs only in the case of living things. Things make up *a* thing when and only when the thing they make up is a living organism: what exists are the simples and living things made up of simples. To be a genuine part is to participate in a life, a natural unity.

As it happens, Aristotle appears to accept that the only true unities are living organisms, and many contemporary advocates of hylomorphism hold that organisms are at the very least paradigmatic instances of unified wholes, along with the particles, the fundamental substances.

Whether principles that account for this unity could be extended to non-living things, organic molecules, for instance, or 'mechanisms', or artefacts, is a

matter of controversy. A minority of contemporary devotees of hylomorphism accept van Inwagen's contention that the only unified composites are living organisms. In this regard van Inwagen might seem to be closer to Aristotle than many recent advocates of hylomorphism. This inevitably raises the question whether these recent advocates are aptly described as advocating hylomorphism.

Please bear with me while I spell out my meager understanding of Aristotle's position. In so doing, I shall heed Aristotle's advice, starting with examples that are easy to understand but that, in the end, can be seen to be misleading (in some respects, deeply so), examples that, like Wittgenstein's ladder, would need to be kicked away once deployed. My discussion relies heavily on Furth 1978, 1988; Gill 2005; Shields 2015; and on Cohen 2015. I shall focus on Aristotle and ignore subsequent developments of Aristotelian metaphysics pursued by early Neoplatonists and medievals.

9.2 Aristotle

Aristotle, a keen observer of the natural universe, was not the first to notice that things apparently change. But what exactly *is* change? Change would seem to require something unchanging, a persisting something that undergoes the change, and ways the something is, ways that come and go. At the limit are creation *ex nihilo* and annihilation, impossibilities for Aristotle, where the subject of change would be the cosmos itself.

Experience reveals that things can change qualitatively, as when a tomato ripens in the sun, turning from green to red, or quantitatively, as when the tomato, in maturing on the vine, increases in volume and mass. Changes of these kinds, 'accidental changes', involve a persisting material object together with something lost and something gained. The tomato loses its greenness and takes on a redness.

In addition to accidental change, Aristotle countenanced substantial change, as when a lump of bronze is formed into a statue, or a collection of planks is assembled into a ship. In such cases you have a quantity of matter that is potentially a certain way. The bronze is potentially a statue, the planks are potentially a ship. Something new comes into being when this potentiality is realized. What a quantity of matter is potentially for depends on the matter in question. A collection of planks is potentially a ship, but not potentially a tomato, a tomato blossom is potentially a tomato, but not potentially a ship.

As in Chapter 3, I shall continue to use the term 'object' to refer to the kinds of thing we naturally think of as objects. These include inanimate things such as electrons, stones, and planets, artefacts such as statues and ships, and living organisms such as microbes and rabbits. In keeping with the subject matter, I reserve the term 'substance' for objects that hew to a demanding principle of unity, instances of 'substantial forms'. Controversy surrounds the question which objects are substances in this sense. For the moment I intend to set the issue aside, but it will resurface soon enough.

As noted earlier, Aristotelian objects are said to be compounds of matter and form. Matter and form are complementary. Matter is what an object is made of, bronze, or wooden planks, or flesh, for instance, and form is what makes it the case that matter makes up an object of a particular kind. Considered individually, matter and form are 'incomplete', each requiring the other, each incapable of independent existence. You cannot have matter without that matter's making up something of some kind, even if the something is merely a heap or a quantity of stuff, and, nonmaterial entities aside, you cannot have a kind of something without that something's having some material composition or other.

Substantial change can occur when one of these components is held constant, while the other comes or goes. When a portion of bronze becomes a statue, its matter takes on a new form. When a ship is repaired, its form survives while some of its matter is replaced. If this is done gradually, the ship might survive the replacement of all its matter. One and the same form persists while the matter it unifies is replaced. On such a view, it would seem to be possible for distinct objects to exchange all of their matter over time while retaining their respective identities.

In the case of artefacts such as a ship, form is imposed by an outside agent, a shipwright, for instance. In the case of living organisms, however, form might be thought to play an active, governing role, managing, typically with outside assistance, organisms' growth, development, and persistence over time and in the face of ongoing material and accidental changes.

This is a sticking point in contemporary discussions of hylomorphism. All parties agree that substantial form is to be understood as a unifier, but differ on whether unification is or involves a kind of process, or activity, or operation, or whether it is merely a 'principle' that a complex object must satisfy if it is to count as the object it is, an essence in the sense discussed in Chapter 4. Aristotle is frequently taken to be committed to the idea that substantial forms are unifiers in the first, stronger sense, that they are responsible for, in

the sense of bringing about or maintaining unities. This is by no means obvious.

Whether forms, be they substantial or accidental, are universals or particulars is itself a vexed question. In Chapter 4, I identified universals with essences understood in a broadly Aristotelian fashion as the *what it is or would be to be*, what it takes to be, something of a particular kind. When the something is an object, as distinct from a property, its essence amounts to an Aristotelian substantial form. This would be to regard substantial forms as universals and individual substances as their instances: 'individual forms' informing individual substances.

Universals thus conceived are not entities, hence not a species of multiply located *entia generalia* capable of functioning as active, top-down organizers. If you have a particular object, a particular rabbit, say, you have an instance of what it is to be a rabbit, an instance of rabbithood. An individual rabbit, Bunkin, is a rabbit by virtue of being an instance of what it is to be a rabbit, by virtue of having what it takes to be a rabbit.

The same holds for properties considered as modes, ways, Aristotle's individual accidents. Accidents could be seen as fully particular instances of universals in the ontologically unexceptionable sense above. Modes, as I have characterized them in previous chapters, constitute a respectable scholastic category that would seem to capture what Aristotle had in mind in thinking of objects' individual accidents. Modes are particular ways individual substances are, modifications of substances. The identity of a mode is tied to the identity of the individual substance it modifies.

This is not because substances are mysterious, bare particularizers, themselves lacking a nature. A substance must be some way (or ways) or other, and a way must be a way a substance is. A beetroot's distinctive redness is a way the beetroot is, a modification of the beetroot. Another beetroot's redness might exactly resemble the first beetroot's redness, but the two rednesses are numerically distinct, one being a way one beetroot is, the other being a way another beetroot is.

You could regard the two beetroots' respective rednesses as instances of redness, and so consider redness a universal. But, again, the universal redness is not a general, multiply locatable entity. If you thought of the universal rabbit as what it is to be a rabbit, and the universal redness as what it is to be red, what you consider when you consider a particular beetroot's color in abstraction from the beetroot and in abstraction from its being the redness of this particular beetroot.

None of this would render individual substances, modes, or universals mind-, or language-, or concept-dependent. Every existing entity is what it is. What it is to be an entity of that kind, is a wholly objective affair, as is what it is to be that very entity, a particular instance of that kind. What is mind-dependent are the words and taxonomies we deploy in identifying the entities we encounter. We construct labels for the kinds of entity we care about for whatever reason, but in creating the labels, we do not create the entities.

9.3 Matter

On one traditional reading of Aristotle common among the medievals, parts of ordinary objects are themselves compounds of matter and form, ultimately fire, air, water, and earth, stuffs that are themselves compounds of 'prime matter' and form.

My assumption in initially sitting down to write about hylomorphism was that Aristotle endorsed prime matter. I was subsequently convinced by David Charles, Anna Marmodoro, Christopher Shields, and especially Anna Schriefl (who pointed me to *Physics* II 1, 193a 9–17 and *Metaphysics Z* and *H*) that Aristotle probably did not.

If that is so, my reservations about prime matter should be taken to apply, not to the historical Aristotle, but to Aristotelians who regard prime matter as essential to hylomorphism. In any case, for reasons that will become evident, Aristotle's commitment to an ontology of stuffs (fire, air, water, earth) would seem to cry out for an underlying, prime-matter-like, bare material something.

Prime matter is sometimes described (by Aquinas, for instance) as 'pure potentiality'. You might understand this as a way of calling attention to the fact that Aristotelian fundamental stuffs could themselves undergo change: water can evaporate and become air, a change that could be explained only if there were a persisting quantity that loses one form and gains another. A portion of bronze is potentially a statue, but not potentially a beetroot or a rabbit. A quantity of prime matter, in contrast, would be potentially anything at all, hence, considered in its own right, 'pure potentiality'.

Thus regarded, prime matter would not be a something, would not itself be a stuff, it would be an indispensable ingredient of any stuff, and consequently an ingredient of any material object. At bottom there are somethings, stuffs, heaps, substances, unities, that are various ways, matter variously informed. In the present context, this is to be understood as expressing the claim that any

existing object is a compound entity comprising matter and form, a thought I shall question in due course. Meanwhile, prime matter must be distinguished from the 'proximate matter' commonly taken to make up material objects, planks that make up a ship, for instance, stones that make up a wall.

A material object can be made up of parts that are themselves objects, as in the case of planks and stones, but ultimately, Aristotle thinks, objects are made up of stuffs, as when a statue is made of bronze. A statue is made of a portion of bronze, and the bronze is perhaps a mixture of earth, water, and air in the right proportions. What of a portion of earth or water or air or some mixture of these? Would these be made up of prime matter?

The answer to this question is not obvious. At any rate, the sense in which a portion of water or earth might be 'made up' of prime matter would seem to be altogether different from the sense in which a statue is made up of bronze or a ship is made up of planks.

You can begin to appreciate the difference by considering an alternative, non-Aristotelian conception of matter according to which the statue is made of bronze, and the bronze, in turn, is made up of atoms of copper and zinc bonded together in a particular way. These atoms are themselves made up of electrons, protons, and neutrons, and the protons and neutrons are made up of quarks. But electrons and quarks are not, so far as we know, 'made up' of anything. In Aristotelian parlance, they would appear to be instances of substantial forms, individual forms, without proximate matter, pure instances of substantial forms (see Lowe 1998).

Earlier I motivated a commitment to prime matter by appealing to the thought that something unchanging was required to accommodate changes in elemental stuffs, as when water evaporates and becomes air. Once the physics of Empedocles is set aside and replaced by a physics of particles and fields, it loses its point and form takes center stage.

9.4 Form

Talk of form brings us back to the idea that objects are said to be *compounds* of form and matter. As noted above, Aristotle, in places, appears to identify an object's form with its essence, and characterizes essences (*Metaphysics* Z, 4) as I have characterized universals, namely as *the what it is or would be to be*, a conception of essence echoed by Locke: 'essence may be taken for the very being of anything, whereby it is what it is' (1690, III, iii, 15). Here, I side with E. J. Lowe, in observing that it is very hard to understand essences thus

characterized as in any sense constituents or components of objects or, for that matter, as entities of any kind.

As Lowe notes, Locke himself seems confused on this point. Immediately after the passage just quoted, Locke describes essences as 'the real, internal, but generally in Substances, unknown Constitution of Things, whereon their discoverable Qualities depend' (1690, III, iii, 15). It is one thing, however, to suppose that what it is to be an object of a particular sort, the essence of the object, as requiring that the object have a particular kind of material composition, and another thing altogether to identify the object's essence with its material composition.

Things, I have been supposing, have essences. For anything whatever, outlandish or commonplace, there is something it is to be a thing of that kind and something it is to be that very thing (as opposed to some other thing) of that kind. It would seem to be a mistake in category to regard what it is to be an *F* (or to be this *F*) as an entity, a something, much less as a constituent of the *F*s (or of an individual *F*).

This, I think, is what separates what I earlier identified as two strains of contemporary hylomorphism. One strain comprises those (Fine, Johnston, Evnine, as I read them) who think of essences or substantial forms as principles, what it is in virtue of which some parts or stuffs make up a whole of a particular kind. These can vary across kinds. In some cases, unity would require a distinctive species of physical bond (as in an H_2O molecule), in other cases, such as a pocket watch, unity results from parts of particular kinds being arranged and attached to one another in the right way, and in still other cases, a fieldstone wall, for instance, spatial proximity would suffice.

If you thought of a principle of unity as providing an answer to van Inwagen's special composition question, the idea would be that there is no single answer, there are as many answers as there are kinds of substantial form or essence.

A second strain of hylomorphism encompasses philosophers (Brower, Jaworski, Koons, Marmodoro, Rea, again, as I read them) who appear to regard substantial forms as engaged unifiers, special kinds of activity, perhaps, or power, or process, or structure, responsible for the integrity of objects they unify. Koslicki is difficult (for me) to place. On the one hand, she seems to accept that forms are principles, on the other hand, she appears to take forms to be components of substances. I urge interested readers to consult first-hand the work of these authors. I am painting with a broad brush. Meanwhile, I shall take it as given that at least some proponents of hylomorphism accord substantial forms an active role as unifiers and consider how that might work.

One possibility is that substantial forms, or their instances, are top-down causal factors that emerge in certain kinds of complex system, features of wholes that oversee the behavior of their parts, features that cannot be accounted for solely by appealing to local interactions among the parts. Such a conception comports well with recent philosophical work on emergence in chemistry and biology as discussed in Chapter 8.

You might arrive at such a picture by supposing that objects, or at any rate objects with the requisite unity, individual wholes, are themselves instances of substantial forms. Suppose, in addition, you thought of substantial forms, or rather their instances, as causally responsible for the integrity and persistence of objects. The whole substance is what is responsible, or partly responsible, for activities of its parts. This amounts to top-down, whole-to-part causation yielding the kind of natural unity van Inwagen and Aristotle associate with living things.

Whether this is how proponents of hylomorphism who accord forms an active, organizing role are thinking about form, something along these lines appears to be what advocates of emergence and top-down causal relations have in mind. The idea is that purely 'mechanistic' causal interactions among parts cannot, by themselves, account for what certain wholes (paradigmatically, living organisms) are and can do. Such wholes are emergent unities causally involved in the unification and behavior of their parts.

Wholes, then, would be additions of being, emergent individuals exercising top-down, whole-to-part causal capacities. On such a view, an artefact such as a mechanical clock would not count as a unified substance because the activities of the clock are founded on, and for that reason, wholly explicable by reference to, activities of its parts.

I am not contending that philosophers who regard substantial forms as active unifiers are thereby committed to top-down, whole-to-part causation. At the very least the idea of top-down causation naturally dovetails with a conception of unification according to which the unifier is in some fashion responsible for bringing about or preserving unity. The top-down model provides one example of what an active unifier might look like.

As I observed in Chapter 8, you might suspect that those who find a top-down picture appealing do so because they underscribe the parts and their tangled interactions. Phar Lap is not simply a horse-shaped collection of particles. A pillar of salt could be such an arrangement. Phar Lap is a dynamic, interactively organized arrangement of particles that, in the course of their complex interactions affect one another, often in appreciable ways. Once you take all this into account, the need for additional whole-to-part influences

would seem less pressing. Besides, there is something unsettling in the thought of a whole that includes a part causally influencing that part, an eddy made up of swirling water molecules influencing the behavior of those molecules.

I recognize that in some quarters these are fighting words, but this is one reason why the first, modest strain of hylomorphism strikes me as more winsome and less encumbered than its competitors. Modest hylomorphism depicts substantial forms, not as entities, not as organizers, not as active unifiers, but as essences, what it is in virtue of which an individual is the kind of thing it is. Such a view is consistent with top-down, whole-to-part causation, but certainly does not require it.

Another possibility is that Aristotle accepted that an object's form could require that the object have a particular kind of material composition, and this composition might include unmysterious unifying powers inherent in its parts, including powers of some parts to alter and be altered by other parts. To recall a latter day example, it might be of the essence of water that water be composed of H_2O molecules, entities exhibiting the right sorts of chemical bond. It would be a mistake to identify water's essence, what it is to be water, with the molecules or with the mechanisms that bond them. (I am grateful to David Charles, in conversation and in Charles 2008, for helping me to appreciate this point.)

Now, however, it would be fair to wonder whether hylomorphism thus conceived merits the label. If substantial forms or essences are not entities, not active unifiers, then what could it mean to regard objects as in any sense compounds of form and matter, form–matter composites? You have matter organized so as to satisfy a principle, something expressible in a real definition, but the principle is not a constituent or feature of unities that answer to it. Nor is there any sense in which the items organized are somehow incomplete without the principle, or that the whole requires the principle for completeness. The whole satisfies the principle, the whole is an instance of the principle.

9.5 The Blancmange Universe

I turn now to another feature of Aristotle's metaphysics that I find especially exasperating, at least when it is juxtaposed with a relatively benign hylomorphic conception of individual objects interacting and persisting over time.

Aristotle rejects atomism, accepting that the material universe is a continuous mixture of elemental stuffs. (I leave aside the difficult question of how partless stuffs could be mixed.) In trying to make sense of this way of

understanding the universe, it is hard not to think of a conception associated with Spinoza. And, although I believe that Spinoza is echoing Descartes here, to avoid historical complexities I shall focus on Spinoza.

There is, according to Spinoza, but one extended substance, the universe as a whole. What we regard as objects—trees, planets, electrons, rabbits—are in fact modes, modifications, ways the one substance is. You could think of these as analogous to concentrations of energy in fields, or local thickenings of space or spacetime, where the fields, or space, or spacetime play the role of substances. If you accept my characterization of essences or if you regard substantial forms as principles, essences in my sense, rather than organizing entities or processes, you could say that, to the extent that a region of spacetime, or a field, or some combination of these has what it takes to be a tree, or a planet, or an electron, or a rabbit, it *is* a tree, or a planet, or an electron, or a rabbit.

Now consider the motions of objects thus conceived. These would be wavelike eddies or disturbances in the fabric of the universe. The motion of a baseball from home plate to the left field bleachers would resemble what happens when a televised baseball makes its way across a television screen. There is no parcel of matter, no 'continuant' occupying successive regions of space, but a succession of modifications in or of contiguous regions of a continuous extended substance.

Far from being an historical curiosity, this way of thinking about material bodies is in some respects closer to the picture coming from physics today than is classical atomism. What are commonly regarded as particles exhibiting identifiable trajectories through spacetime could, for all we know, turn out to be shifting centers of energy in fields or congealed regions of space with the character of bulges in a carpet. In that case, the motion of objects, particles, for instance, would be a kind of undulatory motion, and particles would turn out not to be substances but to be modes of substances, with the fields, or space, or spacetime playing the substance role.

For Spinoza, and maybe for Aristotle, a substance lacks substantial parts, parts that are themselves substances. What you might at first regard as substantial parts of a substance are, in reality, modes, Aristotelian accidents, modifications of the substance. In that case it would be a mistake to think of individual substances as influencing their parts causally. What appear to be parts would be modes, entities dependent on the substance of which they are modes; their antics would be best understood, not as caused by the substance they modify, but as expressions of the dynamic nature of that substance.

Of course, Spinoza and Aristotle differ in their respective inventories of substances. For Spinoza, there is a single substance. For Aristotle there are presumably many substances interacting with one another and providing *relata* for efficient causal relations. So much the better for Aristotle, you might think: none of this *deus sive natura*, monistic hyperbole.

Reflect on Aristotle's metaphysics of stuffs. The universe, or at any rate the terrestrial, sublunar universe, comprises a kind of lumpy primordial blancmange that exhibits local variations in density depending on the relative concentrations of the four elementary stuffs (see Maier 1982: chapter 6; Fine 1995 the image of a blancmange universe comes from Williams 1959a: 3–4). At a particular region you might have a spherical concentrated mixture of earth, water, and air in the right proportions so as to yield a bronze sphere. In another region you have a much more lively mixture making up a rabbit, Bunkin. Although, for Aristotle, Bunkin, and perhaps the bronze sphere, are meant to be substances, it is hard not to see Bunkin and the sphere as modifications, thickenings of, or eddies in, the primordial blancmange, not themselves substances at all. If there is a substance it is the blancmange taken as a whole.

I admit that we are now probably miles from Aristotle, but I cannot resist pointing out (yet again) what strike me as difficulties in reconciling a universe comprising continuous mixtures of stuffs, a blancmange universe, with an ontology of individual, mobile, causally interacting continuants.

Consider the bronze sphere, and imagine Socrates' tossing it across the agora to Simmias. The sphere, a portion of informed matter, appears to move from one place to another through the air, a diaphanous fluid medium. But could that be right? The sphere is, after all, a dense region of an all-encompassing, continuously variable stuff. What separates the ball from its surroundings? How could a discrete, mobile continuant arise in a continuous stuff? A seamless universe might congeal, wrinkle, stretch, vibrate, and deform in various ways but it is hard to see how any 'piece' of it could be separated from any other so as to allow for motion as it is ordinarily conceived.

So what happens when Socrates tosses the sphere? You might think that a spherical portion of matter pushes aside or displaces airy matter making up the atmosphere, and this might well be what Aristotle thought. Given the underlying metaphysics of stuffs, however, the sphere's motion would seem more nearly to resemble that of a bulge shifting from one part of a carpet to another or a pain shooting down your arm. The sphere's motion is an illusion!

Or is it? Return to the Spinozistic picture, and suppose there were just one extended, material substance, space itself, or spacetime, or the universe as a

whole. What we identify as objects would be modes, modifications of this extended substance, local contortions, congealed regions of space. Or consider the possibility that what we today regard as particles are in fact centers of energy in fields or perturbations in space or spacetime.

When Socrates tosses the sphere to Simmias, you do not have a portion of matter occupying successive spatial locations, but successive modifications in an encompassing material substance, something like a cursor's moving across your laptop screen. When the cursor moves, a piece of your screen does not move. Rather you have a sequence of pixels changing color and levels of brightness. Similarly, when Socrates tosses the bronze sphere, what you have is a wavelike sequence of disturbances in a region of spacetime.

This would be what motion *is* in a blancmange universe or a universe of continuous, gapless stuffs, the motion of everything from particles to planets. Just as Spinoza and contemporary physicists are happy to talk about particles moving through space, so my imagined Aristotle could continue to talk about material objects in motion. The truthmakers for such talk, however, given the envisaged physics of stuffs, would include nothing that moves, or at least no discrete portions of matter displacing other portions of matter and occupying successive regions of space.

Yes, all this would severely threaten Aristotle's official view. What we think of as substances would prove to be accidents or modes, local ways the blancmange universe is. We could continue to speak of bronze spheres, tomatoes, electrons, and rabbits, but the truthmakers for truths about such things would tend toward a kind of monism that doubtless would have appalled Aristotle. Perhaps it is true that there are bronze spheres, tomatoes, and rabbits and that these things move about, but the truthmakers are not detached continuants, not self-contained compounds of form and matter. The question is whether Aristotle, given his commitment to a universe comprising a continuous mixture of fundamental elements, a blancmange universe, would be entitled to complain.

Aristotle aside, you will have noticed that the Spinozistic, blancmange universe, always in the background, keeps forcing itself back into the picture. If nothing else, its assertiveness provides a healthy check on overly enthusiastic metaphysical speculation. If this is not clear already, I hope that it will become clear in the remaining chapters, the next two of which concern modality. It will transpire that unity and necessity converge at a deep level and in surprising ways.

10
The Art of the Possible

> The impact of the deployment of possible worlds has been a disaster for the philosophical ecosystem comparable to the aftermath of the introduction of cane toads in Queensland.
>
> *Anon.*

10.0 Modal Truths

We routinely judge that something is *possible* or not, that something *could* have occurred or failed to occur, that, *were* something to have happened, something else *would* have happened. The italicized terms express modal concepts. We deploy such concepts extensively and unselfconsciously in everyday life and in the pursuit of scientific ends. In so doing we seem often to express truths: modal truths. It is true, is it not, that, had you dropped this fragile vase it would have shattered? And is it not true that you and I might never have existed? If such assertions are true, however, it is fair to ask what makes them true, to ask what the truthmakers would be for these and comparable modal assertions.

In this chapter I shall approach modality and modal truths from two apparently contrasting perspectives. I begin with an influential conception of modal discourse promoted by David Lewis. Lewis' conception stems from a non-negotiable Humean starting point, a picture of the universe as altogether lacking interactions among 'distinct existences'. Such a universe would seem to want the materials needed to make modal truths true. In response to this deficit, Lewis introduces the apparatus of 'possible worlds' that I have been calling alternative universes.

As noted in Chapter 1, I prefer to speak of alternative universes because talk of possible worlds carries with it the illicit thought that the alternatives are *merely* possible, that they have a kind of attenuated existence that lends them an undeserved air of ontological innocence.

You might think that Lewis intends these alternative universes to provide truthmakers for modal assertions: modal truths concerning our universe are

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made true by goings-on in other universes. I think it unlikely that this is the best way to understand Lewis, however. Rather, truthmakers for modal truths generally are to be found here at home in our universe: *the* universe. Recognition of this point will, I hope, lead to a clearer understanding of underappreciated aspects of Lewis' Humean picture and pave the way for the consideration of an Aristotelian alternative, with the caveat that the alternative is Aristotelian in the way Lewis' is Humean, which is to say, probably only a little.

Before proceeding, a word on essences is in order. In Chapter 4, I sketched an account of essences according to which grasping something's essence was a matter of having a sense, however partial, of what it takes to be that something. At the time I discussed the idea that, as E. J. Lowe puts it, metaphysics is the science of essence. Lowe, along with Kit Fine and others, holds that modal truths are to be explicated by appealing to essences (see, for instance, Lowe 2018; Fine 1994). This is now regarded by many as a viable alternative to accounts of modality associated with Lewis.

At the time, I questioned the metaphysical significance of essences. Rather than subjecting you the reader to a rehash of that material, however, I shall move ahead in a positive vein, first, discussing Lewis' approach to modality, then taking up an Aristotelian competitor. As will become clear in upcoming chapters, the discussion here will prove tentative and provisional, another ladder to be tossed aside after being climbed. Owing to its organic nature, that is how it is in metaphysics.

10.1 Alternative Universes

Few philosophers have had a greater impact on the cast of contemporary metaphysics than David Lewis. This is especially so for the metaphysics of modality and its multifarious tributaries. Philosophers today find it entirely natural to say that something is possible if it occurs in, or, as Lewis prefers, *at*, one or more alternative universes, necessary if it occurs at all, or all pertinent, universes. It is true that, had you dropped the vase you are clutching, it would have shattered if, at the 'nearest', most similar universes at which you (or someone very like you) drops the vase (or a very similar vase) it shatters. There are indefinitely, in fact infinitely many, universes. At some, laws of nature differ from those in our universe; at some, donkeys, or creatures resembling donkeys, talk; at some, you and I were never born; at some, Steve puts Old 97 into Spencer on time.

Frank Jackson speaks for many when he observes that 'the possible worlds methodology has more than paid its dues' (Jackson 1998: 11). Michael Loux follows suit:

> Metaphysicians have argued that this idea [of a plurality of possible worlds] is perfectly respectable, indeed, that it is implicit in our prephilosophical thinking about modal matters; and they have claimed that it provides the tools for clarifying not only the concept of *de dicto* modality (the notion of necessity or possibility as ascribed to a proposition), but also of *de re* modality (the notion of a thing's exemplifying a property necessarily or contingently). (Loux 2002: 176)

Lewis' alternative universes are meant to exhaust the space of logical possibilities, broadly construed. These outstrip the resources of our universe including our linguistic and conceptual resources. A majority of the universes are 'inaccessible' to us. Because the space of logical possibilities is perfectly objective, wholly mind-independent, the best candidates for its occupants are real, fully actual universes.

A minority of philosophers who invoke alternative universes side with Lewis in regarding the alternatives as fully real. Most do not. Most regard talk of alternative universes as a *façon de parler*, useful, even indispensable, in regimenting modal concepts, but not to be taken literally. For these philosophers the pretend you who drops the vase at a 'nearby' universe *is* the you who forbears dropping the vase at this universe, the one and only actual universe. For Lewis, in contrast, there is just the one you, just the one undropped vase. Other universes include 'counterparts' of you and the vase, intrinsic duplicates of you and the vase, the careers of which closely resemble yours and the vase's or do so for a time, then diverge.

Notice first, that none of Lewis' alternative universes, including ours, could itself have been other than it is. Alternative universes are determinate four-dimensional 'Humean mosaics' of qualities, each occupying its unique niche in the space of logical possibilities. The universe we inhabit, one universe among many, is what it is. It, our universe, could not have been otherwise. As philosopher Yogi Berra would have put it, had our universe been otherwise, it would not have been *our* universe.

A slightly different way to think about this is spelled out by Armstrong (2004: 144–5). The set of universes is a necessary entity: the set, whatever it includes, could not have failed to exist. Parts of a necessary entity are themselves necessary entities. A given universe could not have failed to be and to be as it is.

Even if our universe could not have been other than it is, might our universe have failed to exist? More dramatically, might there have been nothing, no universe at all, rather than something? Not according to Lewis (1986b: 73; see also Heil 2013). The absence of the, or a, universe is literally an empty possibility. Why is there something rather than nothing? Because nothing is not an option. Every region in logical space is, of necessity, occupied. That is how it is with logical space.

The difficulty now is to accommodate modal discourse, which evidently serves us well both in science and in everyday life, and to do so in a way that makes modal assertions something more than mere subjective projections, to do so in a way that makes modal assertions objectively correct or incorrect, true or false. Might the laws of nature have been different? Might you have failed to exist? If the universe simply is what it is and is so of necessity, such questions would be idle. Yet they seem not to be idle. Indeed they seem to admit of empirical confirmation or disconfirmation. How could that be so? Lewis provides guidance for those who adopt a Humean viewpoint.

10.2 Humean Supervenience

In part owing to the influence of 'the possible worlds methodology', philosophers today regard contingency as easy. Contingency rules. The universe itself is contingent provided there is at least one alternative universe, and there are plenty of those. A constituent or feature of the universe is contingent provided there is at least one alternative universe that differs from our universe with respect to that constituent or feature. Your having the precise height you have is contingent if you have, and you unquestionably do have, a counterpart at one of the other universes who is a different height. Given that there is no shortage of alternative universes, near universal contingency is assured.

This picture of unrelenting contingency, however, must be understood in concert with Lewis' doctrine of 'Humean supervenience'.

> Humean supervenience is named in honor of the [great] denier of necessary connections. It is the doctrine that all there is to the world is a vast mosaic of local matters of particular fact, just one little thing after another. (But it is no part of the thesis that these local matters are mental.) We have geometry: a system of external relations of spatio-temporal distance between points.

> Maybe points of spacetime itself, maybe point-sized bits of matter or æther or fields, maybe both. And at these points we have local qualities: perfectly natural intrinsic properties which need nothing bigger than a point to be instantiated. For short: we have an arrangement of qualities. And that is all. There is no difference without difference in the arrangement of qualities. All else supervenes on that.
>
> (1986a: ix–x. In the first sentence of the quotation, I have substituted 'great' for 'greater', which occurs in the published version. Anthony Fisher informs me that Lewis made this correction in his own copy.)

So, on Lewis' view, truths about the universe are made true by this Humean mosaic. In fact, as will become evident, my invocation of truthmaking here is, in certain respects, misleading. I shall continue to speak of truthmaking, however, because it serves to keep the discussion focused on both modal judgments and ways the universe is that you might have thought answer to these judgments.

Meanwhile, one feature of Lewis' Humean universe deserves mention. In the quoted passage, Lewis says that 'we have an arrangement of qualities. And that is all'. Were that really all, Lewis' professed agnosticism about universals would not stand up. The qualities could not be universals. You need many cases of particular kinds of quality to fill out the mosaic. If these were universals, that would be impossible: similar qualities would be identical across instances. So, if you have *just* the qualities, you are committed to something like D. C. Williams' conception of qualities as 'tropes'.

You could avoid this problem, if it is a problem, and make room for agnosticism about universals by supposing that the qualities were qualities *of* something: spacetime, perhaps, or of 'point-sized bits of matter or æther or fields, maybe both'. All this is important, but not something I intend to dwell on here. I return to it in Chapter 12.

Lewis' characterization of Humean Supervenience echoes the words of one of Lewis' teachers at Harvard, the aforementioned D. C. Williams, who puts it this way:

> The world whole, I take at least as a working hypothesis, absolutely all there is, is a four-dimensional plenum of *qualia* in relations, eternally actual through and through. Its fundamental pattern, which all other structure presupposes, is that of whole and part: the Big It is not merely infinitely divisible, or virtually infinitely, but infinitely *divided* in the sense that it is the

> sum of countless actual parts, countlessly including, overlapping, and excluding one another, each part and each whole as genuinely real and individual, in the cardinal logical and ontological respects, as any whole which includes it, right up to the World All, and as any part which is included in it, right down to the ultimate indivisibles which have no proper parts, if such there be. Each of the parts thus intrinsically individuated, identical with itself and distinct from everything else, each *thing,* is related to each other part or thing, and to itself, in two further fundamental ways, by location, that is, the distances and directions which compose the four-dimensional spread, and by resemblance (with the proviso, in default of a better inclusive word, that 'resemblances' covers both likeness and unlikeness). (Williams 1959a: 2–3)

On such a view, there are no metaphysical constraints on possibility. The only sense in which something is possible or impossible is its being logically possible or impossible, there are no 'grades' of possibility or necessity. Modality is univocal—and supremely unrevealing as to the nature of the universe we inhabit, which is what it is, neither more nor less.

The difficulty now is to find a place for ordinary modal discourse. We commonly distinguish what is logically possible, what is consistently statable, what is coherently thinkable, from what is genuinely possible, what is in fact possible. You could understand Lewis as endeavoring to provide a viable account aimed at finding a role for these, and various other, modal locutions within a Humean framework apparently hostile to modality.

Lewis' proposal is that you can distinguish logical from natural possibility via the thought that something is naturally possible when its difference from what is the case falls within acceptable limits. The limits are set by, among other factors, entrenched scientific theories. This, he believes, accords with ordinary ways of thinking about possibilities.

Earlier I noted that a minority of philosophers who appeal to alternative universes in discussing metaphysical topics regard the alternatives as real. (Even Williams, who disapproved of Lewis' many universes, was happy to talk the talk of possible worlds in the course of discussing possibilities in various places; see, for instance Williams 1953: 3, 7, 8 [1966: 74, 78, 80].) Multiverses aside, few think of the universe we inhabit as merely one unremarkable member of a mob of universes. Lewis, in contrast, professes 'modal realism', according to which alternative universes are as real as the one in which we happen to reside: 'I advocate a thesis of a plurality of worlds . . . which holds that our world is but one among many' (1986a: 2).

Real, fully actual, alternative universes 'out there' are required because you could not construct all of the rest from ours, you could not build them up by recombining elements of our universe. Many, probably most, outstrip our finite conceptual and imaginative capacities. They must speak for themselves. Here, Lewis appears to be sharply at odds with Nelson Goodman, another of his teachers at Harvard, who wrote that 'we have come to think of the actual as one among many possible worlds. We need to repaint that picture. All possible worlds lie within the actual one' (Goodman 1955: 57).

10.3 Modal Realism

Modal realism has struck most philosophers and all non-philosophers as eccentric and unappealing. I am going to propose a way of understanding Lewis that might make his modal realism, or something in the vicinity of modal realism, more palatable, even—for a Humean interested in accommodating modal discourse—attractive.

Suppose you followed Lewis' Hume in thinking that there are no necessary connections within the universe. Considered four-dimensionally, the universe is a pointillist arrangement of qualitative bits, each bit entirely independent of every other bit. A universe and everything at a universe is what it is, but not because anything else is what it is.

What to do? Everyday and scientific discourse are rife with modal pronouncements. We speak with confidence of what would happen were you to drop the vase or an electron were to move into the vicinity of another electron. We recognize what would have occurred had Steve backed off Old 97's throttle on approaching the Danville trestle. We make important decisions based on our beliefs as to what might or might not occur, and we distinguish unadorned logical possibility or impossibility from what is in fact, or really, or naturally possible or impossible. What aspect of the universe might make such locutions true or false? What resources does the universe afford that would justify modal assertions? Modal discourse evidently reveals *something* about the universe, but what?

We accept, reasonably it would seem, that you and I could have failed to exist, or had different colored hair, or been different heights. The elusiveness of truthmakers for these claims, however, apparently calls them into question. One possibility is that such claims are rarely, if ever, warranted. A second possibility is that the claims are engineered to express, not modal facts—in a Humean universe there are no such facts—but facts about similarities.

There is, as well, a third possibility. When you assert that you might have had another height, for instance, you do not take yourself to be calling on details of the circumstance of your genetic and biological development. Rather you are calling on causal–dispositional features of your developmental milieu. You tell a companion that a ball would roll were it nudged. In saying this, you are expressing a belief about the ball's powers or dispositions. More precisely, your belief concerns the ball's powers and its circumstances, as those circumstances bear on manifestations of the ball's powers.

I mention this possibility in order to set it aside for the time being. In embracing Hume, Lewis forgoes powers and dispositionality. Truthmakers for assertions such as 'the ball would roll' could not be powers possessed by balls. What is the alternative? If you are a Humean, your only recourse is to invoke similarity: the ball resembles similar objects known to have rolled when nudged in similar circumstances. When, on a particular occasion, you think, 'There but for the grace of God go I', you recognize that the circumstances surrounding the plight of some unfortunate are disconcertingly similar to your own.

Enter alternative universes. I have recommended that you think of the space of logical possibilities as comprising universes differing from ours and from one another in one or more respects. (Williams speaks of 'attribute spaces'; see Williams 1959a, 1963, and Fisher 2015.) The structure of this space is a wholly objective matter. It is what it is and its constituents are what they are quite independently of any thoughts you or I might have about it or its constituents. You can consider the possibility of things being less or more different from the way they are. This generates an ordering of logically possible circumstances, an ordering of universes across a similarity space of universes.

Now when you think, 'Were I to stir this sugar into this cup of tea, the sugar would dissolve', you are expressing your confidence that sugar dissolves in hot tea, a confidence based on the similarity of the envisaged occurrence to ones with which you are already familiar, either from personal experience or by hearsay. Lewis puts it this way:

> The character of our world . . . makes the counterfactual true. But it is only by bringing the other worlds into the story that we can say in any concise way what character it takes to make the counterfactual true. The other worlds provide a frame of reference whereby we can characterize our world.
>
> (1986a: 22)

So the role of alternative universes is to provide a 'frame of reference'. More generally, appeals to alternative universes equip us to spell out what we are

doing when we make modal assertions about the universe as we find it. (Armstrong 2004: 445–6 makes a similar point.)

What of Lewis' trademark modal realism, his assertion that all those alternative universes are as real as the universe in which we find ourselves?

> When I profess realism about possible worlds, I mean to be taken literally. Possible worlds are what they are, and not some other thing. If asked what sort of thing they are, I cannot give the kind of reply my questioner probably expects: that is, a proposal to reduce possible worlds to something else.
>
> I can only ask him to admit that he knows what sort of thing our actual world is, and then explain that possible worlds are more things of that sort, differing not in kind but only in what goes on at them. (Lewis 1973: 85)

Put yourself in the place of someone with Humean sympathies self-consciously advancing a modal claim. In entertaining thoughts of alternative situations, you are not thinking of purely imaginary or fictitious situations called to mind willy-nilly, you are not thinking of Oz or Middle Earth, but of situations in a perfectly objective similarity space of situations centered on your own.

Lewis accepts that modal assertions have associated truth conditions and that it is perfectly objective whether these conditions obtain. But the role of the alternative universes is not to serve as truthmakers for modal statements. How could they? If our universe is modally bereft, how would it help to add more of the same?

The truthmakers are to be found among features of the universe we inhabit. These features are objectively similar or dissimilar to various alternative situations, including 'alien' situations we lack the capacity to consider or describe. If you tie realism to truth, then this is realism, or a kind of realism, about the alternative situations.

Is this all-out modal realism? Probably not. But it is at least in the neighborhood. Once you have the universe, the 'actual' universe, the alternatives are fixed, their standing as more or less similar counterparts of the universe is perfectly objective. Similarity is a nontransitive relation, so similarity spaces are going to grade off into inaccessible spaces in which little or nothing is similar to what we have here. Now, if you consider just the space of alternative universes, the status of our universe within that space of alternatives is in no way privileged. From this perspective, in this frame of mind, all the universes are on a par: modal realism on the cheap, 'painless modal realism' analogous to painless realism about universals (§ 4.5).

10.4 Contingency

Moving Lewis' Humeanism temporarily to the back burner, reflect once more on contingency and on the fact that it is commonly supposed that contingency is easy, necessity hard. An ordinary truth about the universe is contingent unless proved otherwise. The universe itself and occurrences in the universe appear tenuous, contingent. The universe might have failed to exist altogether, or might have been very different in character. Contingency rules. Contingency is the default. Claims concerning necessities require defense, contingencies come for free.

Could this be right? What is it to 'appear contingent'? What does contingency look like?

Children are told that for millennia people believed the sun orbited the earth because this is how it appears: it looks (and feels!) as though the sun rises in the east, moves across the sky, and sets in the west. But how would it look and feel if the earth rotated, as it does, on a tilted north–south axis and orbited the sun? Exactly as it has always looked! (G. E. M. Anscombe attributes the observation to Wittgenstein; see Anscombe 1959: 151.) How would it look if Spinoza were right and every occurrence were rigidly necessary? Just as it looks now.

Recall two examples mentioned already: you and I might not have been born, the laws of nature might have been different. You, and I, and the laws of nature are contingent.

But why think that? Could you have failed to be born? That is hard to say. For you not to have been born, the universe would have had to be different in myriad ways. But could it have been different in all, or even very many of those ways? Do not say that the answer is easy: there are alternative universes, possible worlds at which you were not born. That would just be to assert that your birth is contingent, the very point at issue. Given the other universes, anything goes.

What of laws of nature? Are the laws contingent? Who is to say? The question is a broadly empirical one, not something a philosopher would be in a position to ascertain simply by bringing to mind things' behaving differently than they do. Claims about contingency must earn their keep. This is especially so when something's being contingent plays a substantive role in a philosophical argument.

It would seem, then, that our access to truthmakers for modal truths pertaining to the universe is thoroughly fallible, more, not less, so than our access to truthmakers for ordinary non-modal truths about the universe.

A second point concerns the character of relations among distinct states of the universe. Scores of influential philosophers and their disciples follow Lewis and Lewis' Hume in accepting that distinct entities are 'entirely loose and separate'. Even philosophers who doubt that this is always so, exhibit a bias in favor of contingency, although the claim that *A* and *B* are necessarily connected requires defense, the claim that *A* and *B* are only contingently related is awarded a free pass. When you engage in serious ontology, however, there are no free passes.

Philosophers of a Humean stripe point to causal relations as obviously, uncontroversially contingent: causes and effects are patently loose and separate. In Chapter 7, I argued that there is reason to think that causation is robustly non-contingent, at least it would be if causal relations are understood in the ordinary way as bringings about.

Physics does tell us that physical processes, or some physical processes, are non-deterministic. When a radium atom decays, it does so non-deterministically. There is no cause of its decaying when it does. In that case, what physics tells us is that some occurrences are spontaneous, some events are uncaused, some movers unmoved.

Here we arrive at a respectable source of contingency: spontaneity. If the decay of a radium atom at a particular moment were spontaneous, it would be contingent that the atom decayed at that moment. Were the Big Bang the upshot of a spontaneous fluctuation in the vacuum, then the universe would be contingent.

At least the universe would be contingent provided a distinct spontaneous fluctuation would have spawned a distinct universe, a difficult thought. Suppose a radium atom decays spontaneously coughing up an atom of radon and an α -particle. Had it decayed earlier or later, would it have yielded the same atom, the same α-particle? You tell me.

Notice, however, that whether the universe or an occurrence in the universe is contingent is not something that could be ascertained by calling to mind alternative universes. There is a fact of the matter, although perhaps a fact no one could ever be in a position to ascertain.

Notice as well that the kind of contingency under discussion is not available to Lewis. The contingency of the decay of a radium atom evaporates when you consider that nothing in any universe could have been other than it is. If this radium atom had not decayed precisely when it did, it would not have been this radium atom. Lewis is sensitive to the difficulty, but I shall forego discussing it further here and instead point curious readers to Lewis 1994.

Where exactly is all this leading? Suppose that one source of contingency is spontaneity of the kind you have in the decay of an unstable element, and suppose that causation is flatly non-contingent. In the course of discussing causation in Chapter 7, I invoked the notion of a causal-dispositional matrix, the idea that the causal structure of the universe amounts to a vast interactive network, an evolving three-dimensional web, not a one-dimensional chain.

As yet, nothing within this causal web would be contingent. Now introduce here and there spontaneous, as I am supposing, genuinely contingent, occurrences. Contingency, in the form of uncaused causes and their effects proliferates throughout the system. If the Big Bang were itself spontaneous or if it were the product of some spontaneous occurrence, then the universe as a whole would be contingent.

The contingency in play, however, is not unconstrained, anything goes contingency. Although it might be contingent that a radium atom decays today rather than tomorrow, it is not contingent that, when it decays, a radium atom yields an atom of radon and an α-particle. Roughly, something, your birth, for instance, would be contingent only if the conditions responsible for it included spontaneous elements that could yield different outcomes.

Well, is it contingent that you were born? Were the universe contingent, were the Big Bang spontaneous and were it capable of yielding distinct universes, then everything in the universe, including you, would inherit the universe's contingency, although this would not distinguish you from anything else.

It is another question whether laws of nature being what they are is contingent and whether, given the Big Bang, given the universe, an occurrence in the universe is contingent. If physics is right, if spontaneous occurrences are ubiquitous, and if such occurrences breed contingency, it is a good bet that your having been born is tinged with contingency.

It would not follow, however that characteristics you might be thought to possess accidentally—your determinate height, your hair color, your tastes and talents—are contingent in the sense that you might have been different in these respects. That would depend on features of the unimaginably complex dispositional matrix within which you came to be.

You might suspect that my harping on contingency misses the point. The universe is what it is, to be sure, but there could have been another, perhaps very different, universe, or even no universe at all.

What would warrant that thought? What reason could you have for thinking some other universe might have existed in place of this one? Whether that is so is not something anyone is in a position simply to eyeball or stipulate.

What constraints does reality, capital-*B* Being, place on universes? Our best attempts to answer this question are going to require appeals to physics, but there is no guarantee that answers will be forthcoming. Under the circumstances, the appropriate attitude is a cautious suspension of judgment and a recognition that contingencies must be earned.

So much for the ontological preliminaries. I shall have more to say on this topic in Chapter 11. Meanwhile, however, I hope you will at least agree that, if modal truths are made true by features of the universe, truthmakers for these truths are going to be elusive: difficult or, at times, impossible to pin down.

Now we face an apparent puzzle, however. We seem happy to endorse counterfactual claims and accept the contingency of all sorts of conditions that could easily turn out to be anything but. Modal discourse plays an important role in everyday and scientific descriptions and explanations of goings-on around us. We are apparently justified in many of our modal assertions, we accept many such assertions as true, but it is hard to see how this could be so, or how we could ever be warranted in thinking it so, given the elusive character of truthmakers for modal truths. Lewis at least has a story here: modal discourse is founded on similarities. What else is there?

Earlier, I briefly mentioned one non-Humean alternative according to which modal discourse is made true by powerful ways the universe is. By now you are likely losing patience and more than ready to look more closely at this alternative.

10.5 Aristotelian Modal Realism

Suppose I am right, suppose contingency is not easy. Any assertion to the effect that the universe or some feature of the universe is contingent expresses a substantive judgment requiring defense. Physics gives us reason to think that some occurrences are uncaused, spontaneous. Spontaneity would appear to be one source, perhaps the only source, of genuine contingency. The universe is contingent if the universe resulted from a spontaneous occurrence, a cataclysmic uncaused fluctuation in the vacuum, maybe, and if a different fluctuation would have produced a different universe. The universe might or might not be contingent. The jury is still out.

A theological option could be pressed. The universe would be contingent if it were the product of God's free choice. Even in that case, however, the choice in question would need to be suitably spontaneous and not, for instance, an inevitable consequence of God's divine nature. God inevitably chooses the

best, so, if God chose this universe it is the best universe (assuming, what might be false, that there are no ties). God's freely choosing would explain there being a universe, but not there being this universe. That would flow of necessity from God's nature, just as the nature of a radium atom ensures that, when it decays, the upshot is an atom of radon and an α-particle. The decay is spontaneous, hence contingent, but not the outcome.

Earlier I noted that, even if the universe were not itself contingent, particular features of the universe would themselves be contingent to the extent that they issued from spontaneous occurrences within the universe—the decay of unstable elements, or spontaneous fluctuations in the vacuum, or in space itself. If this is right, the answer to the question whether the universe or some particular feature of the universe is contingent or could have been otherwise would be nontrivial.

Suppose, as I have argued, we cannot but accept that the universe includes substances and properties. Properties are fully particular ways substances are, and every substance is some way or other. Substance and property are correlative categories. This much we know. What we do not know, or know with any certainty, is what the substances and properties are. For that you need physics, which is still under construction and far from complete.

Williams' and Lewis' elements of being are particular inert qualities. On the rival Aristotelian conception, properties are empowering qualities in the sense discussed in previous chapters, qualities of substances that empower those substances in distinctive ways. The die is cubical. By virtue of its being cubical, the die would tumble or slide (not smoothly roll) down an incline, would make a concave square impression in a bucket of wet sand, would look cubical, would feel cubical.

The die's cubicality is a quality, but not merely a quality. The die's cubicality empowers the die to behave in various ways in concert with other empowered objects. What the die would do in a given circumstance depends on its entire complement of empowering qualities and on qualities possessed by everything with which it interacts. The die's powers would manifest themselves in particular ways with particular kinds of reciprocal power. Such manifestings are continuous, symmetrical affairs.

Think of a spoonful of sugar dissolving in a cup of hot tea. The sugar and tea interact cooperatively to yield a dissolving. The dissolving is the mutual manifesting of powers of the tea and the sugar working together to produce a result. A manifesting of this kind constitutes a causal nexus.

To the extent that causings are bringings about, causing is continuous and symmetrical. There is a before and an after: the sugar must be placed in the tea

before you have a dissolving. Once the dissolving occurs, the sugar is dissolved in the tea, the tea sweetened. There is the state of the universe prior to the dissolving, the dissolving, and the state of the universe once the dissolving is consummated. But the dissolving itself is continuous and symmetrical.

Put this together with the idea that an empowering quality's identity turns on what the quality equips its possessor to do, what powers the quality gives to an object so qualitied. In many cases, in the case of the die's cubicality, for instance, qualities empower objects for different kinds of manifestation with different kinds of reciprocal partner, different kinds of reciprocal power.

Suppose that *A* is a power to manifest itself in way *M* with a *B*: *M* is a mutual manifestation of *A* and *B*. Then, if you have *A* and *B* (suitably related: the sugar is in the tea), you have *M* (sweetened tea). This means that the manifesting of powers is internally related to those powers: if you have the *relata* appropriately organized, you have the relation.

The case is underdescribed and on that account potentially misleading. You could always introduce additional factors that would 'block' or 'prevent' an *A* and a *B* from yielding an *M*. By adding a particular chemical to the tea, you might prevent the sugar's dissolving: you have an *A* and a *B*, but no *M*. You do not have nothing, however. The addition of new powers yields a different dispositional setup, hence a different kind of manifestation, one that does not include the sugar's dissolving. Given the powers on hand, however, you have a particular kind of manifestation.

Instead of thinking of the universe as a four-dimensional distribution of impotent qualities, what happens when you think of it as a distribution of objects with empowering qualities? The universe would unfold as objects' powers mutually manifest themselves, yielding new distributions of powers that mutually manifest themselves, yielding in turn new distributions of powers. Once spontaneous manifestings are added to the mix, contingency crops up throughout the system. The universe so considered might be thought to provide all the truthmakers you need for the truths that have truthmakers: Aristotelian supervenience.

Supervenience? I use the term because Lewis does, and I have been describing an Aristotelian counterpart to Lewis' Humeanism. In fact, talk of supervenience in this context is nothing more than a stand-in for talk of truthmaking. Thus construed, supervenience is not a relation among properties or states of the universe. Rather, it is a cross-categorial relation between a truth bearer, a judgment or description, for instance, and some way the universe is, the way that makes the judgment true.

Where does this leave modality? For Lewis and Williams, given that the universe is as it is, its features are in no regard contingent. For this universe to exist is for it to have these features, features *this* universe could not have failed to have. Might the universe be contingent if its existence were a brute, inexplicable fact?

The matter is nontrivial: for Lewis, if any universe exists or could have existed, they all do. The absence of a universe is not an option, and there is no room for brute facts (the subject of the next chapter). Given the universe, its features are contingent only in the Humean sense of being independent of one another. Nothing in the universe necessitates or is necessitated by anything else in the universe. Individual somethings are necessitated by the whole.

The alternative is to reintroduce interactive connections among features of the universe. This is what happens when you replace impotent qualities with empowering qualities. Now features of the universe cease to be independent of one another. Successive states of the universe are determined by their predecessors: if you have the states, you have their successor states.

Except when you do not. Physics tells us that some powers manifest themselves unilaterally, spontaneously. The occurrence of spontaneous manifestings of powers infects the whole with contingencies.

10.6 Aristotelian Modal Discourse

I have suggested a way of understanding Lewis' deployment of alternative universes that yields a Humean understanding of the significance of everyday modal discourse, and I have sketched an Aristotelian competitor. The Aristotelian option appears to require a kind of two-tiered account of modality. On the one hand, there are the elusive deep modal truths made true by ways the universe is. On the other hand, there are the everyday modal judgments the aim of which is evidently more modest. Among other things, such discourse expresses beliefs about the contributions of individual empowering qualities.

You might think that a two-tiered conception of modal discourse would be a liability: Lewis has just the one, supremely parsimonious level. But is that so? On Lewis' view, the deep truth about the universe is that it is as it is and indeed *it*, the universe we inhabit, could neither have failed to be, nor could it have been otherwise. Against this background Lewis offers a semantics for everyday modal discourse founded on similarity.

As I see it, the difference between the Humean picture offered by Lewis and the Aristotelian alternative sketched here, lies in their respective ontologies of the universe as it we encounter it. Lewis' universe comprises a *de facto* distribution of simple, unconnected qualities. The alternative is a universe of empowered, difference-making substances. Such a universe provides the resources to account for and make sense of both 'levels' of modal discourse. Lewis, of course, can do the same. It all boils down to the relative plausibility of the two competing conceptions of the universe: a Humean conception of a universe comprising indolent, passive qualities, and an Aristotelian universe of interrelated powerful substances. And here, there is no contest.

If you still have reservations about the Aristotelian picture, ask yourself, would non-Humean, Aristotelian universes be included among Lewis' plenum of universes, or must every universe be Humean? Aristotelian universes would seem at least to be logically possible, hence members in good standing of the mob of universes. Were Aristotelian universes genuine possibilities, however, they would seem to afford their residents a non-Humean basis for modality. Can you be confident that our universe is not one of those universes?

• • •

Is this the end of story? At one time I would have said so. I now think that matters are both more nuanced, much more interesting. When all is said and done, the attractiveness of the Aristotelian picture could, like that of the real Aristotle's physics, turn out to rest on its utility in negotiating the manifest image. So buckle up and prepare to put yourself in the brace position. The captain has informed us that we could be headed for a bumpy landing.

11
Brute Fact

> While we look not at the things which are seen, but at the things which are not seen: for the things which are seen are temporal; but the things which are not seen are eternal.
>
> *Corinthians II*, 4:18

> 'I do loathe explanations.'
>
> J. M. Barrie, My Lady Nichotine 1913

11.0 What Would Make a Fact Brute?

Earlier I postponed discussion of brute facts. My aim now is to convince you that the perspective on modality I have been invoking brings with it a sensible way of addressing the question, what makes, or would make, a fact brute. The question whether any facts are brute facts will prove more difficult than you might have imagined. Modality, whether we philosophers like it or not, is fraught.

Philosophical conceptions of brute facts are closely related to thoughts of 'primitive' entities. Primitive entities are not artefacts discovered by archaeologists excavating iron age burial sites, but indefensible entities posited by philosophers in the course of advancing metaphysical theses. The entities are indefensible, not because they are outrageous (although often enough they are), but because, in the context, no argument could adduced in their favor.

Primitive entities are typically enlisted because they are regarded as unavoidable. They have the status of axioms in metaphysical systems. Entities primitive for one philosopher could be explicable by a philosopher of a different persuasion. But, it is assumed, everyone needs some primitives. Axiom systems can be constructed with the empty set of axioms, but no ontology has the empty set of primitives.

My focus here will be on brute facts because much of what I have to say about brute facts applies *mutatis mutandis* to primitive entities. The primitiveness of an entity is not an intrinsic feature of that entity, but an epistemological, explanatory measure of its status. If there are no brute facts, there are

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no inherently primitive entities. Our inability to explain an entity would be an expression of our epistemological limitations, not an indication that the entity has a pivotal ontological standing.

In considering brute facts, you might start with the idea that a brute fact is unexplained: the fact obtains, but there is no explanation as to why it obtains. This would seem to make facts of logic and mathematics brute. Even if the truth of 7 + 5 = 12 is explicable by reference to axioms of arithmetic, the axioms appear inexplicable. In this regard, truths of logic would be even better candidates for brutehood.

This might seem to miss the point. Talk of brute facts concerns contingent facts, facts that might have been otherwise. Suppose it were true that objects do indeed attract one another in accord with an inverse square law. This might be a candidate brute fact. The fact that the speed of light is what it is, the fact that certain laws of nature, rather than others, hold, and the fact that the universe, *our* universe, exists are widely regarded as brute. Some philosophers believe that the dependence of conscious states on the material makeup of conscious agents is brute: there is an unbridgeable 'explanatory gap' between physical features of conscious agents and agents' conscious states. And, in any case, we all know, or think we know, that explanation must stop somewhere.

So considered, brute facts would be singled out epistemologically, bruteness would be identified by reference to explanation. This would tie brute facts to what we are at a given time in a position to explain. Facts that might count as brute in one era could succumb to explanation later. The opposite could be true as well. Facts once thought to have been explained might later be accounted brute. Aristotelian explanations of the inevitable motions of celestial bodies were replaced by appeals to brute, unexplained forces in Newtonian physics.

Suppose you thought of scientific explanation on the model of an axiom system (Friedman 1974). Theorems deducible from the axioms and perhaps contingent truths deducible from the axioms supplemented by sentences expressing observations would be explained. The axioms would be unexplained, hence brute. Given that alternative axiomatizations are available, what counts as brute in one system might, in another system, be fully explained.

This way of approaching brute facts has not gone unchallenged (see, for instance, Barnes 1994; Fahrbach 2005). Learning that a fact is brute, would be to learn something about the fact, namely that it is inexplicable. Such facts would differ from those for which explanation is merely temporarily unavailable or elusive. Thus characterized, brute facts, according to Eric Barnes, are in

no sense mysterious. 'If *O* is known by scientists to be ontologically brute, then . . . *O* represents no mystery whatsoever [but] is simply partly constitutive of [the] way the world is' (1994: 64). He continues:

> [O]ur understanding suffers a gap just in case there is some hidden explanatory basis for a fact we know to hold true—where there is no hidden explanatory basis, and we know this, there is nothing lacking in our understanding—for there is no explanation that we fail to have. (1994: 65)

Barnes advocates a distinction between 'ontological' and 'epistemic' brute facts. What is epistemically (or explanatorily) brute depends on transient explanatory factors. Ontologically brute facts, in contrast, stem from what might be regarded as structural features of the universe, or structural features of reality or of being itself, that constrain every other feature. I accept that something like this is right, but more needs to be said about the ontology.

11.1 From Facts to Ways

One place to start would be with a consideration of facts. Brute facts are a species of fact, but what are facts? There is no uncontested answer. For some, facts are obtaining states of affairs. For others, facts are true propositions or what true propositions express. It would be a pity if an accounting of brute facts were hostage to one or another conception of facts, however. Put somewhat paradoxically, if the aim is to provide a serious ontology of brute facts, we should do well to move beyond fact terminology.

I propose to substitute for 'facts', talk of ways the universe is, trusting that this captures well enough what philosophers concerned with brute facts have in mind. By 'universe' I mean all there is. If there are Everettian multiverses, then these are encompassed by the universe, although, for the sake of simplicity and my own psychological well-being, I shall forego further mention of multiverses. What I do not include in the universe are nonactual, *merely* possible universes, or transcendent realms of *abstracta*. Even if there are such things, they would seem to have no bearing on the nature of bruteness or on the question whether some characteristics of the universe are brute.

One advantage of replacing talk of facts in this manner is that it excludes mathematical and logical truths from consideration. Such truths, whatever their status, are not made true by ways the universe is: they hold indiscriminately, everywhere and everywhen, a claim I shall not endeavor to defend here

(see Cameron 2010; Rayo 2010; Heil 2012: 168–78). Even if you disagree, however, you might at least be willing to concede that questions of brute fact do not concern truths of logic and mathematics.

What of necessary truths that are neither logical nor mathematical, linguistic and conceptual truths, for instance? To the extent that these are understood as pertaining only to ways in which we represent the universe, as items the truth of which does not depend on ways the universe is, these can be excluded from consideration as well. I have in mind truths such as bachelors are unmarried, not truths *about* representations: assertions, judgments, and the like, which do belong to the universe. Thus '"rabbit" denotes rabbits' is made true by some complicated way the universe is.

This concedes the field to what are commonly regarded as contingent ways the universe is. Some of these ways are present owing to the universe's being other ways. Their presence is dependent on and potentially explicable by reference to these other ways. Particular particles attract one another as they do, in part owing to gravitation. Had laws pertaining to gravitation been different, had an inverse cube law held rather than the familiar inverse square law, the ways particles—assuming, what seems doubtful, that such a universe would be hospitable to particles—would attract one another would have been very different. So it appears that the way particles attract one another gravitationally is not brute. What of the inverse square law? And, more generally, might laws be brute features of the universe?

One possibility is that some laws are brute, while others are dependent on, perhaps by virtue of being derivable from, these laws. A law would be brute were it 'fundamental', not a consequence of other laws. Returning to an analogy invoked earlier, you might think of fundamental laws as axioms, less-than-fundamental laws as theorems, and ordinary contingent truths as derivable from theorems together with various other contingent truths. Laws at the highest level, the axioms, would be candidate brute features of the universe.

What of supposedly contingent features of the universe that seem not to depend on other contingent features or on other contingent features plus the laws? Fundamental constants, for instance, might be thought brute. That light has the speed it has is said to be brute. Perhaps brute features of the universe are those expressed by the fundamental laws—the axioms—and those associated with the fundamental constants. What about its being the case that there is an odd (or even) number electrons. This might appear to be brute, but it could turn out that, given the initial conditions and the laws of nature, there could not have failed to be a definite number of electrons, whatever that number might be.

Stephen Hawking, no friend of philosophy, speaks philosophically when he says:

> Einstein once asked the question, 'How much choice did God have in constructing the universe?' If the no boundary proposal is correct, he had no freedom at all to choose the initial conditions. He would, of course, still have had the freedom to choose the laws that the universe obeyed. This, however, may not have been all that much of a choice; there may well be only one, or a small number, of complete unified theories. (Hawking 1988: 174)

11.2 From Laws to Powers

Although appeals to laws provide one kind of account of brute features of the universe, they are at best a preliminary staging point. The difficulty is that in appealing to laws it is unclear what exactly is being appealed to. Differently put, if it were true that there is a law to the effect that objects attract with a force proportional to their mass and inversely proportional to the square of their distance, what would make this true?

If you accept that we are better served by a conception of the universe as a universe of powers, or powerful objects, what laws there were would depend on what powers there were. In that case the focus on brute features of the universe shifts from laws, to objects' powers. And if powers of complex objects depend on powers of their simpler constituents, the focus turns to powers of objects discussed by physicists, the quarks and leptons, for instance, the fields, maybe space itself or spacetime. Perhaps it is a brute feature of the universe that electrons have the mass or charge they in fact have.

For such a suggestion to take hold, it would need to be the case that electrons' having a particular mass or charge is contingent, something that could have been otherwise. You might doubt this on the grounds that anything with a mass or charge different from an electron would not be an electron. Even if correct, however, this leaves open the question whether there might have been particles other than electrons, no electrons at all, or maybe particles rather like electrons but possessing a slightly different mass or charge.

Well, might there have been such particles? Who is to say? The answer is not to be found by invoking alternative universes populated by concocted, 'alien' particles. The question is whether the alternatives are genuine

possibilities, possibilities admitted by reality, and this is not something you could reasonably expect to work out at the Eagle and Child. For all we know, reality, being itself, might impose constraints on the possibilities. What is logically, conceptually, or linguistically possible, what seems possible, might not be genuinely possible (where the 'might' is a for-all-we-know 'might').

Even if universes with alien features were possible, it need not follow that anything goes, that any imaginable universe is possible. As Hawking observes, the possibilities could be narrowly constrained. Indeed it is hard to think that they are not constrained, the only real question being to what extent this is so. The genuine possibilities, the seeds of whatever is, lie in the nature of reality itself. As Martin Lin led me to see, for centuries, this point was typically made by reference to God's essence, what it is to be God. My way of putting it is meant to be theologically neutral.

But why suppose that reality, capital-B Being, has a nature? Why *not* think that anything goes?

What would make it the case that anything goes? Presumably Reality's nature being wide open. The question is not whether reality has a nature, but whether its nature admits of any coherently imaginable possibility or whether the possibilities are constrained by something more substantive than principles of logic and mathematics.

The important point to note is that, in either case, the question whether a feature of the universe is brute, would depend on the character of reality. If reality admitted of only one possibility, then the forces and objects of fundamental physics and their features could not have been otherwise. This would be so even if the Big Bang were the result of a spontaneous eruption in the vacuum. In contrast, if reality, although constrained, admitted of more than one possibility, then the bruteness of features of the universe would depend on whether there is an answer to the question, why this universe rather than some other? And, again, this is not something decidable in the SCR (or even the pub).

11.3 Reality's Constraints

You could be forgiven for growing impatient with portentous invocations of reality and being itself. A natural thought is that brute facts are anchored in contingencies. Perhaps a particular way the universe is amounts to a brute fact when the universe could have failed to be that way, and no other ways the universe is necessitate its being *this* way. One of the refrains of this book, however, has been that contingency is not easy.

Consider causal contingencies. Effects are contingent on causes which are, by and large, themselves effects of, hence contingent on, other causes. Effects are not ontologically brute: given the causes, you have the effects. An uncaused cause, however, would, *qua* cause, be brute. If physics is right, the decay of a radium or plutonium atom would be a spontaneous, uncaused occurrence. Is the decay 'ontologically brute'?

It is (presumably) of the nature of an unstable element to decay spontaneously. Its decaying precisely when it does is uncaused, but its mode of decaying is built into the atom's nature. What appears brute, if anything does, is not the atom's decaying, but that there are atoms with this nature, that there are radium and plutonium atoms at all. And it is at least an open question whether radium and plutonium atoms are mandated by reality.

The same point applies to the Big Bang, which, for the sake of argument, I have been pretending was, like the decay of an unstable element, a spontaneous occurrence, a cataclysmic uncaused cause. Were that not so, were the Big Bang the product of a causal process or something akin to a causal process, the nature of whatever underwent this process would be at issue. If the Big Bang emanated from a fluctuation of the vacuum, then the power so to fluctuate would have been of the nature of the vacuum. And then the question would be whether the vacuum could have failed to have the nature it had. At least this is so if 'vacuum' means what it does in today's physics and not, as it once meant, utter nothingness.

I admit that I struggle to understand nothingness, what was traditionally called the void (for some help, you could turn to Grant 1981). A void would not be an unoccupied region of space. It could not be anywhere in space, but neither could it be outside space. Where would it be? Nowhere. One important lesson here is that nothing is to be gained by speculating on nothing, so I shall move on.

If features of the universe were constrained by reality, by being itself, if the range of possible features were limited, then you might wonder, why *these* features? Whether reality coughed up the universe by chance or not, the ontologically significant brute items would be features of reality. For suppose that it were only by chance that a universe with the features of our universe existed. That our universe was an option, even if only one among many, leads unavoidably back to the idea that reality, being itself, calls the shots, when it comes to contingency and necessity, the buck stops with reality.

And what of reality? It would seem to make no sense to ask why reality is as it is. This would be so even for someone who accepted God as the author of all that is. Does this mean that reality's being as it is is the Big Brute Fact? Maybe

not. The impossibility of an explanation of the nature of reality itself stems not from its being the case that explanation must stop somewhere, but from the status of reality itself as arbiter of what could and could not be.

Spontaneous occurrences aside, could the universe have been other than it is? More dramatically, could the universe have failed to be? This question admits of at least two interpretations.

First, might the Big Bang never have occurred, might the state of whatever there was prior to the Big Bang have continued without yielding a universe? This would seem to be a broadly empirical question, albeit one we might never be in a position to answer.

Second, might there have been nothing at all, no universe, no pre-Big-Bang embryonic universe, nothing whatever? There is something, there is the universe. This could be so only if reality included a potential for what is. But a reality that includes a potential for a something is a something: there being nothing is not an option.

If reality is such that there is potentially something, there is something, something with a specific nature, forever poised to yield, but perhaps never yielding, a particular universe. You can coherently ask why the universe exists, perhaps, why it is as it is, but you cannot ask why there is anything at all, why reality is as it is.

Ex nihilo nihil fit: Nothing comes from nothing. Had there had been nothing, there could not have been something. Given that there is something, there having been nothing is not on the cards.

11.4 Whither Humeanism?

The discussion, which began with a low-keyed attempt to understand what brute facts might be, has taken on an unexpected air of drama, ascending from pedestrian thoughts of unexplained explainers to the why-is-there-something-rather-than-nothing question. The aim, however, has been to bring to the fore ontological considerations bearing on the modal status of ways the universe is.

Philosophers today see contingency and bruteness everywhere, one result of an unwholesome reliance on the apparatus of alternative universes in the analysis of modal discourse. Once you leave these behind, the territory can take on a very different cast, although as I suggested in Chapter 10 (and discuss further in the next chapter), the point holds even within a framework of alternative universes.

Implicit in this comment is the idea that we should indeed leave the alternative universes behind. The universes were introduced in an attempt to provide a venue for modal discourse given a prior commitment to Humeanism. Once you replace Hume with Aristotle, you acquire resources for the explanation of a large class of modal assertions. Powerful ways the universe is could warrant modal assertions about occurrences in the universe and indeed for the occurrence of the universe itself.

The possibility of alternative universes is constrained by the nature of reality itself, something we might never be in a position to grasp or to grasp fully. So regarded, contingency and its attendant bruteness have no privileged standing, no presumptive innocence until proven guilty.

Once you see this, you are in a position to appreciate the extent to which our thoughts on modal aspects of the universe have been compromised by a deeply corrosive Humean bias. Humeanism seems an essential strand in the DNA of contemporary metaphysics. The Humean idea that there are no necessities in reality is taken as given, an innocent background assumption requiring no defense. What must be defended is any departure from Humeanism. Like the heavyweight champ, Humeanism retains the crown until it is decisively defeated.

I hope that by now you are with me in thinking that, when it comes to ontology there are no defaults, no free passes, no heavyweight champs. Humeanism is a substantive doctrine as much in need of defense as any other.

You might agree with this assessment, yet have qualms about where it is all heading. I have become immune to qualms, preferring to follow the ontology wherever it leads. Consider just causation. The idea that causal relations are contingent is a staple of Humeanism. If you shed Humeanism, however, and take seriously the idea that *A*'s causing *B* is a matter of *A*'s bringing about *B*, then, if you have *A*, you have *B*.

I mention causation, first, because causal relations are so often regarded as external, paradigmatically contingent relations and, second, because they figure prominently in an extended defense of the Principle of Sufficient Reason undertaken by Michael Della Rocca (see Della Rocca 2003, 2010; see also Pruss 2006; Melamed and Lin 2015). This is the principle that 'for each thing (object, state of affairs, or whatever) that exists or obtains, there is an explanation for its existence, a reason that it exists' (Della Rocca 2010: 1).

The principle of sufficient reason is closely related to the idea that underlies my discussion here, the idea that it is no accident that the universe is as it is. You could think of the principle of sufficient reason as the epistemological counterpart of the metaphysical thesis that reality, being itself, imposes constraints on what is or could be the case.

I am less optimistic than some proponents of the principle of sufficient reason that anyone could ever be in a position to know or discover that no other universes are possible, or that this could be established a priori. The apparent occurrence of uncaused causes might ensure a measure of rank contingency, but even this conforms, as it must, to the dictates of reality. It is hard not to think that bruteness, like so much else in philosophy, is of our own invention.

12
Roots of Things

> Philosophy is not higher and suprascientific. It is the lowest and grubbiest inquiry round the roots of things, and when it answers real questions about the world, it is and can only be an inductive science.
>
> D. C. Williams 1966: 147

12.0 Stirring the Pot

In Chapter 7, I spelled out in loving detail an Aristotelian conception of causation. Once you have powers in the picture, you have the ingredients of a robust account of causal production. The account takes causation ontologically seriously, treating instances of causation as bringings about. But how seriously should causation be taken?

Today it is not uncommon to hear philosophers of science dismiss causation as a philosophical pretender, a folk scientific holdover from a simpler past on a par with the humors, caloric, or the æther. (Russell 1912 is most often cited here, but see also Field 2003; Norton 2003; Ney 2009.) The idea is that if you look at the sciences, and at physics in particular, you find little support for the thesis that causation is a bedrock feature of the universe.

Although I am suspicious of such arguments, I accept that causation, and by causation I mean efficient causation, could turn out to belong only to the manifest image. Causal truths could have noncausal truthmakers. Explaining why this might be so promises to reveal much about ontology and the relation thought and language bear to the universe.

Having suffered though chapters in which powers were painted in a highly favorable light, chapters in which Aristotelianism was depicted as clearly superior to Humeanism, and chapters in which causation was painstakingly characterized in terms of bringings about, you would be forgiven for finding this a disconcerting suggestion, at least in the context. As I hope to convince you, however, it is all of a piece with a natural line of reasoning that begins with comfortable truths pertaining to the manifest image and proceeds to ask

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what the nature of the truthmakers for these truths might be, as revealed by the scientific image.

The idea is not that the scientific image inevitably exposes the manifest image as a fraud. Rather the scientific image, roughly, what you have in physics, affords a way of understanding what the manifest image is an image of, the character of the truthmakers for perfectly unexceptionable truths of the manifest image. The discussion of relations in earlier chapters provides a simple model.

What if, as I believe, truthmakers for relational judgments turned out to be nonrelational features of the universe? Would that mean that relational judgments were false or that there are, in reality, no relations? Why should it? Los Angeles is east of Reno. You had breakfast before you had lunch. Relational judgments are often true. But this leaves open the nature of the truthmakers for relational truths. It would be misleading or worse to characterize such a position as eliminating relations or reducing them to something else.

My reasons for thinking that relational truths have nonrelational truthmakers did not appeal to physics, but I believe that physics has a bearing on its ultimate plausibility. This is because the question whether the universe is corpuscular or not, whether it comprises many substances, or a handful, or just one, itself, is, at bottom, an empirical question, not something to be settled by philosophers. Even if the universe is corpuscular, however, it is an open question whether the behavior of the corpuscles is best explained by invoking efficient causation.

12.1 Layered Ontologies

The advent of functionalism, a half century ago, coupled with the demise of reductionist programs in the philosophy of science, encouraged philosophers in the 1980s and '90s to take up a layered picture of reality. Some called themselves nonreductive physicalists, but even philosophers who rejected the physicalist label accepted the idea that reality is hierarchical, higher-level items being dependent on more fundamental lower-level entities. Some things are fundamental, the rest take their marching orders from these.

Discussions of properties afford one example. Higher-order, or, as I prefer, higher-level properties were said to supervene on lower-level properties: properties at higher levels are grounded in lower-level realizers. The 'pain property' was frequently cited as an archetypal higher-level property dependent on, but not reducible to, its lower-level physical realizers. The thought was

that what goes for psychological properties goes for biological properties, meteorological properties, sociological properties, and, in general, properties studied by the special sciences or familiar from our everyday give and take with the universe.

Grounding has supplanted supervenience, but hierarchical conceptions of reality remain influential. Hierarchical ontologies are a manifestation of what I have called slippage, one of the unhappy by-products of linguisticized metaphysics. These days philosophy departments advertise positions in 'metaphysics or philosophy of language' as though these were interchangeable. And, as everyone recognizes, if Human Resources says *p*, *p*.

Progress in philosophy, to the extent that there is progress, is rarely the result of someone's producing conclusive arguments against a prevailing doctrine. Philosophy moved on from phenomenalism, for instance, not because phenomenalism was shown to be false or incoherent, but because it came to be seen as optional. Alternatives proved more interesting and productive. This is the spirit in which I offer this chapter. If I accomplish nothing else, maybe I can at least to persuade anyone tempted by a hierarchical picture of reality to consider moving on. I hope to do so, not by confronting the picture directly, but by calling attention to what might be thought a more appealing alternative.

12.2 Speculative Cosmology

Much of what follows is an exercise in what D. C. Williams called speculative cosmology (see Williams 1953: 3/1966: 74; Campbell 1976: 21–2). Williams saw metaphysics as comprising, in addition to speculative cosmology, analytic ontology. Analytic ontology, the subject of Chapter 2, concerns indispensable ontological categories: 'the traits necessary to whatever is, in this or any other possible world' (1953:3/1966: 74).

Analytic ontology is presupposed by speculative cosmology, which seeks a general account of features of the universe as it stands or as it might be. Speculative cosmology proposes answers to the question, 'what kinds of things are there, what stuff are they made of, how are they strung together?' (1953:3/1966: 74).

Williams' own speculative preference was for a cosmology comprising a four-dimensional spread of particular qualities, tropes, and their multifarious combinations (Williams 1953: 2–3). Topes that overlap spatially and temporally make up what we apprehend as objects—trees, rabbits, planets,

electrons—and dignify with names. These collections stand out, but are in no regard ontologically privileged.

In Chapter 10 I connected Williams' cosmology to that of his student, David Lewis. For Williams and Lewis, reality is ontologically flat. A four-dimensional Humean mosaic of qualities affords truthmakers for truths that have truthmakers.

What of Lewis' myriad possible worlds, alternative universes on a par ontologically with the actual universe? These are invoked by Lewis in the course of reconciling modal discourse with the Humean mosaic. Williams, in contrast, would appear to have only logical possibility and necessity.

A Humean universe is notably lacking in resources for making modal claims true. The situation is not improved by adding more such universes. In a Humean universe, nothing brings about anything else; everything simply is as it is, and not otherwise. Counterfactuals, for instance, would be, if not literally senseless, uniformly false. Could you have been taller or shorter than you are? Well, anyone taller or shorter than you is not *you*.

Were you to drop this tennis ball, it would bounce. That seems true, but what could make it true, what feature of the universe is responsible for its being true? When you judge that the ball would bounce, you are thinking of similar balls in similar situations that bounced. You would be warranted in saying that this tennis ball would bounce were it dropped provided similar balls in similar circumstances bounced when they were dropped. This is not meant to provide a solution to the problem of induction, only a way of accommodating counterfactual locutions to a universe in which everything simply is what it is.

But why regard modal discourse as an embarrassment, something that requires reconstruing? Why settle for a modally bereft Humean universe? Why not abandon Humeanism, an unpromising doctrine on the face of it, and replace it with a version of Aristotelianism, endowing objects with powers or dispositions that, conspiring with one another, bring about particular outcomes?

On such a view, truthmakers for truths such as, 'Had you dropped the tennis ball, it would have bounced', would be objects' dispositional makeup, the disposition of tennis balls to bounce when dropped on hard surfaces and a reciprocal disposition of hard surfaces to resist penetration by balls resembling this one, with the result that a tennis ball striking a hard surface would compress then expand rapidly: the ball would bounce.

On the face of it, a view of this kind seems vastly preferable to a Humean conception of a universe in which things simply happen as they do, 'just one

little thing and then another'. For starters, it appears closer in spirit to the image of the universe we have from the sciences, according to which the universe is teeming with dynamic processes that produce, and do not simply regularly precede, outcomes that in turn productively yield further outcomes.

Although I believe this is a fair criticism of the Williams–Lewis agenda, my goal in this chapter, indeed in the book as a whole, is not to defend Aristotelianism, but to make explicit what you take on board when you embrace Aristotelianism or one of its competitors. With that thought in mind, I propose to look more closely at the cosmology advanced by Williams and Lewis, or a version of it, and consider its implications. Understood in a certain way, the Williams–Lewis model can begin to look surprisingly attractive.

12.3 Speculative Speculative Cosmology

Suppose, with Williams and Lewis, that the universe is a four-dimensional patchwork of qualities. Williams is explicit that these qualities, the tropes, are both particulars and self-standing: if tropes are qualities, they are not qualities inhering in substances. To say that a rose's redness is a quality of the rose, is not to say that it modifies or inheres in a substance, the rose, but simply to say that a particular redness is one of a collection of compresent qualities that together make up the rose. Inherence, at best an awkward metaphysical relation, is replaced by parthood, which, in comparison, is well understood.

Although Lewis is not so forthcoming, it would be natural for him to go with Williams here, embracing Hume's scepticism about substances. To be sure, Lewis does say that 'we have an arrangement of qualities. And that is all' (1986a: x). That sounds like Williams. Williams' qualities are tropes, however, and Lewis professes neutrality on the question whether the qualities are tropes or universals (see, for instance, Lewis 1986b: 63–4).

In § 10.2, I observed that, if Lewis' qualities, like Williams', are meant to be self-standing, they could not be universals. Lewis needs many distinct occurrences of similar qualities, and, if these were universals in the manner of Armstrong, there could be only one of each quality. At the time I suggested that you could reconcile Lewis' agnosticism about universals by allowing that the qualities are qualities *of* something, spacetime, for instance, an option mentioned, but not dwelt upon, by Lewis. Taking this route, however, would require embracing a two-category, substance–property ontology, and so put substances back in the picture.

Neutrality on both substances and universals could be sustained in two ways, however. First, you might think that a universal, or the functional equivalent of a universal, is simply a set or collection of similar tropes. Such a collection would be coextensive with instances of universals of the kind defended by Armstrong.

Second, and in my judgment more plausibly, you could understand universals as Williams himself does, accepting what Campbell calls painless realism (Williams 1959a; Campbell 1990: 43–5; § 4.5). The difference, he thinks, 'between a case and a kind, between a particular and a universal, is not a difference in *category* but a difference in *rule for counting*' (Campbell 1990: 44).

Suppose you have six occurrences of a green trope, qualitative components of six ripe avocados. Considering each case of green, each green trope, as distinct is to consider it as it is in itself, consider it as a particular. However, given their similarity, you could also treat each individual trope as a qualitative representative of all the others. Just as in considering the avocado's greenness you abstract from the avocado, you can abstract from a trope's particularity. In this regard, there are six green tropes, but just one green. This affords a conception of universals in a universe of particulars: painless realism.

Although, as you might have gathered from Chapters 2 and 4, I am sympathetic to something in the vicinity of Williams' brand of realism, I shall not pause here to discuss it, but merely allude to it by way of minimizing apparent differences between Williams and Lewis and thereby setting aside irrelevant complications in what follows (see also Fisher 2017).

Williams and Lewis both speak of qualities distributed in spacetime. This leaves open the nature of spacetime itself. Is spacetime simply another quality, an all-encompassing trope compresent with every other trope? The relation between spacetime and tropes *in* spacetime is apparently asymmetrical in a manner unbecoming a trope. Further, physics tells us that spacetime, or at any rate space, it itself qualitied (see Krauss 2012; Nerlich 2013). Space has a topology. Space has energy. Space is capable of coughing up particles spontaneously. Space appears, not to be one quality compresent with all the others, but to be a qualitied something, a substance.

Graham Nerlich suggests that space, time, and spacetime are 'unique ontic types' (so not substances), but the view sketched here provides a way of seeing how space or spacetime could be substantival without explanations of gravitational phenomena requiring causal interactions between space and bodies in space, a requirement Nerlich considers objectionable (see Nerlich 2013).

If space were a substance, or substance-like, and qualities were distributed in space, what relation would these qualities bear to space? One possibility, mentioned already, is that the qualities are not *in*, but *of* space: qualities making up the Humean mosaic are qualities of space (or spacetime). Because this would introduce substances, or a substance, into the ontology, it would appear to be sharply at odds with Williams' official one-category trope ontology and perhaps at odds with Lewis' as well.

I would worry about this more were I not convinced that a one-category trope ontology is a nonstarter. Two reasons for this come immediately to mind.

First, space appears to be distinctly substance-like, a propertied something. This, coupled with the substance-like nature of fields, would be difficult to reconcile with a one-category ontology of tropes.

Second, space and spacetime aside, Williams' tropes, considered as self-standing particularized properties, are themselves hard to distinguish from qualitied 'junior substances'. Unlike a mode, a trope is self-subsisting in the sense that it could exist apart from any other trope or collection of overlapping tropes. Tropes are 'freely recombinable'. If you separated a tomato's redness from the tomato what would you have? The redness would seem to have departed with the trope. How could that be so, unless the trope itself were red? And where would this leave the tomato? What would a tomato minus its color look like? No answer seems satisfactory.

If these observations are on the right track, it would be a mistake to mourn the prospect of abandoning Williams' one-category ontology. You can approximate Williams' picture by supposing that his tropes are really properties or modifications of space, or spacetime, or the fields, or a single unified field, or, as is perhaps more likely, the universe as a whole. Thus construed, tropes would amount to modes, a category firmly entrenched in a substance–property ontology. Modes owe their identities to the substances they modify: Socrates' paleness is unique to Socrates, a paleness, similar to, but numerically distinct from other palenesses. Unlike Williams' tropes, modes do not have, but *are* natures, qualitative modifications *of* whatever they modify.

In earlier chapters I argued that this is not an ontology of 'thin' or bare particulars clothed in properties. By now you know the drill. Substance and property are correlative categories. Substances are propertied entities, properties being modifications of substances, particular ways individual substances are. Any substance must be some way or other, any property, any way, must be a way some substance is.

What the substances and properties are is a broadly empirical question. The substances might be particles, for instance, although the suggestion on the table is that the best candidates for substances could, for all we know, turn out to be the fields, or spacetime, or the universe itself. At any rate these possibilities yield a speculative cosmology close in spirit to the cosmologies of Williams and, by extension, Lewis.

In such a cosmology Socrates is not a substance but a variegated mode, a disturbance in a field, a wrinkle in spacetime. Socrates' paleness, a way Socrates is, is a facet of the Socratic disturbance or wrinkle. Socrates' paleness is not a second-order mode, not a property of a property. A property of a property would be a way a property is, and a way a property is, a way a way is, is just the way's being as it is. A substance can be some way, but a way is not any way at all: substances are modified, modifications are not.

Although such a cosmology has much to be said for it, I propose to postpone extolling its charms and focus instead on two of its implications. In so doing, I hope to convince you that aspects of the cosmology you might at first regard as deeply implausible are in fact benign. The appearance of implausibility stems from natural, but avoidable, misunderstandings. You might think, for instance, that the cosmology depicts a static, 'frozen' universe, one that abolishes motion and change, and you might suspect that the cosmology is inhospitable to efficient causation, at least to the extent that causation is understood as a kind of necessitating or bringing about.

Understanding the issues requires coming to terms at last with the relation between the manifest and scientific images and looking beyond levels of being.

12.4 Change and Its Basis

Consider, first, the ubiquity of change, intrinsic change, as when a tomato ripens, and changes color, and extrinsic change, as when the tomato shifts its location in rolling down the supermarket aisle into the path of an unlucky shopper and is crushed to a pulp. Change and interaction are everywhere. The sciences are heavily invested in the discovery of explanations as to why things change as they do.

It would appear, however, that a Williams–Lewis Humean universe is inimical to change of whatever sort. In such a universe nothing *really* changes. Everything just is as it is once and for all. An object's persisting over time amounts to nothing more than there being a temporally extended collection of coinciding qualities. An object's changing intrinsically, a tomato's turning

from green to red, for instance, is a matter of a particular collection of compresent qualities at one time including a green component that is replaced at a later time by a red component, although this way of describing it is importantly misleading. The collection making up the tomato does not change. You have one collection at one time and, at a later time, another collection that differs in one or more of its members from the first.

If there is a problem here, however, it is not the absence of change, not a commitment to a frozen universe. For Williams and Lewis, change can be real, the universe dynamic. Think of the Williams–Lewis model as providing an account of what change amounts to, an account of the truthmakers for truths about changes.

The more serious problem with the Williams–Lewis picture is not change, but the basis of change. *Why* do things that are as they are change as they do? All a Humean can say is that they *do*. It is simply a remarkable fact about our universe that so many changes appear to be instances of widespread uniformities. Within the universe, however, there is no deeper basis for, or explanation of, these uniformities. Scientists might regard uniformities as evidence for lawful processes, but for a Humean, laws are simply expressions, not the bases, of uniformities.

This aspect of the Williams–Lewis universe is a consequence of the fact that Humeanism leaves the universe wanting modal resources. Nothing in the universe necessitates or produces anything else, nothing could have been other than it is, nothing in the universe ensures that if you were to stir sugar into a cup of tea the sugar would dissolve.

It is tempting to describe features of such a universe as wholly contingent, but that would be to misunderstand the nature of the Humeanism in play. Chapters 10 and 11 were meant to establish that contingency does not come easily. Something's being contingent is a modal characteristic of the something. All we can say about a Humean universe is that it, and everything in it, is what it is. The fact that *it* could not have been otherwise suggests, if it suggests anything, necessity, not contingency.

One way to improve the situation, assuming that it calls for improvement, would be to replace Humeanism with Aristotelianism, introducing an element of modality by way of dispositions or powers. Qualitied objects making up the four-dimensional spread would be seen, not as inert, but as produced by and capable of producing changes in other qualitied objects.

This apparently attractive option remains viable, however, only so long as the universe is understood as harboring distinguishable locally interacting substances. An appeal to interactive powers loses its allure once you move to

a universe in which objects are, not substances, but modes, modifications of spacetime or fields. On such a conception, particles, for instance, would turn out to be abstract particulars, coinciding energy concentrations in fields, maybe, or local contusions in spacetime. What a physicist would characterize as an accelerating particle would be a wavelike disturbance, a shifting bulge in the spatial carpet.

12.5 Efficient Causation

In such a universe, what happens to efficient causation? I mean to focus the discussion by asking you to imagine that the fields are unified: there is a single field approachable in different ways. Were that so, distinctions among fields would be distinctions of reason or conception only, not real distinctions. More precisely, distinctions among fields would be what Spinoza, following Suarez, Descartes, and his scholastic counterparts, called 'distinctions of reasoned reason'. If the distinction between *A* and *B* is one of reasoned reason, then *A* and *B* are not *really* distinct, *A* and *B* could not exist apart, yet the distinction has a 'foundation in reality'. This is the distinction Spinoza thought held among the attributes of the one substance, and it is a distinction that I contended in § 5.6 holds between objects' qualitativity and dispositionality in an Aristotelian universe comprising distinct, interacting substances.

Scholastic and early modern philosophers contrasted 'real distinctions' and 'distinctions of reasoned reason' with 'distinctions of reasoning reason', the distinction between *A* and *A*, when you consider that *A* is *A*, which are unfounded, and 'modal distinctions', the distinction between a mode (Socrates' paleness) and the substance it modifies (Socrates) (Suarez 1597; see Melamed 2013 for discussion of this and the points that follow as they pertain to Spinoza).

Because Spinoza provides an excellent model of the kind of universe I have in mind, a modally imbued alternative to the Williams–Lewis universe, it might be useful to reflect briefly on Spinoza's cosmology.

Spinoza, picking up where Descartes left off, embraces a two-category ontology of substances and modes. Although Descartes is less than perfectly consistent, I follow Spinoza in taking Descartes' considered view to be that a substance is characterized by a single, master attribute. The terminology is potentially misleading. An attribute is not a property of a substance, not a way the substance is, but the substance itself, in the sense of *what it is*.

This is sometimes put by saying that a substance *is* its attribute, an extended substance, for instance, *is* its extension. The 'is' here is not the 'is' of strict identity (see Melamed 2013; Shein 2018). Attributes are essences, and essences are not entities, hence not candidates for being strictly identical with any entity. Extension, the attribute, is *what it is to be* a material substance, what it takes to be a material substance is to be extended.

Descartes can be read as supposing that the material universe comprises a single extended substance, space itself (this is Campbell's 1976 reading; for discussion, see Garber 1992: chapter 5; Bennett 2001: chapter 5; and Lennon 2007). What we think of as objects, particles, for instance, would not themselves be extended substances, but modes, modes of extension, eddies, modifications of space.

If properties such as mass and charge cannot be seen as purely geometrical modes of extension, mass and charge would appear to have no purchase in such a universe. Its physics would be exclusively geometrical, exclusively kinematic, with no place for forces, or at least no place for physical forces. This is not altogether unlike what you have in the case of gravity in general relativity (see Nerlich 2013), but it is not something I intend to rely on here.

In Cartesian physics, the total amount of motion in the universe is conserved, but minds, nonmaterial mental substances as well as material bodies, could alter and be altered by the trajectories of material bodies. A mental substance is a substance characterized by the attribute of thought, mental properties being modes of thought, ways of being conscious. Notice, however, that if material bodies are modes of extension, not extended substances, not mobile atoms, mental–material causation would not be a species of billiard-ball-like interaction in which the billiard cue is nonmaterial. It would be more akin to a case in which your having an embarrassing thought results in your blushing.

Moving from Descartes to Spinoza, takes you closer to something in the neighborhood of Williams and Lewis. Descartes might or might not have held that there is a single extended substance, but Spinoza is clear on the point. The universe itself is a solitary substance. The substance, the universe as a whole, the cosmos, is extended, and extension is an attribute of the one substance. In this regard, Spinoza is a Cartesian. Unlike Descartes, however, Spinoza holds that the universe has multiple, indeed, infinitely many, attributes, although finite minds are capable of grasping only the two Cartesian attributes, extension and thought.

The idea is intriguing. You have one, multiply attributed substance. The substance *is* each of its attributes, the distinction among attributes being one of

reasoned reason, a founded distinction but not a real distinction. In reality, but not in conception, the attributes are unified. Objects, including ordinary objects and whatever particles might be posited by physics, are modes of extension. In the manifest image, objects appear to be substances and complexes made up of substances. When you point to or describe an object, a rabbit, or a planet, however, what you are pointing to or describing is in fact a mode, a way the universe is locally.

Now take a deep breath, relax, be mindful, and pretend that spacetime is the one substance and the fields are its attributes. Suppose, further, that the fields are at bottom unified: the distinction among them is one of reasoned reason, not a real distinction, but still one founded on the nature of the universe: the universe, owing to its nature, admits to being considered in these various distinct ways. In such a universe objects, the particles, for instance, would be modes, splotchy ways the universe is. Where does this leave efficient causation?

In the course of discussing Aristotle's metaphysics of stuffs in Chapter 9, I suggested that thoughts of efficient causation are thoughts of local interactions among self-standing objects: billiard balls, planets, electrons, living organisms. In so saying, I was siding with Keith Campbell.

> Thinking in terms of cause and effect is an essentially pluralistic way of conceptualizing the cosmos. Cause and effect must be distinct existences for the notions to have any application at all. So discrete items (local events, specific instances of properties or particular objects), are the terms with which causation deals. Analysis, so often called for in refining a causal explanation, identifies simpler and simpler structures as the protagonists in causal transactions, and so gives this inherent pluralism an atomistic tendency. (Campbell 1990: 124)

In my imagined Spinozistic universe, billiard balls, planets, electrons, and living organisms would turn out to be modes, modifications of the One. Do modes interact? Billiard balls interact, but the supposition in play is that, behind the scenes, parties to such interactions amount to blushes, or wavelike ripples in the texture of space. This leaves open two possibilities.

First, these blushes or wavelike apparitions might interfere with one another, cases of interference amounting to instances of efficient causation. Patterns of interference among waves is a familiar phenomenon in physics, so this is a possibility that must be taken seriously.

It is not the only possibility, however. The evolving distribution of modes might more plausibly be regarded as an expression of the nature of the universe itself. This would remove efficient causation from the scene. Changes in the distribution of modes would have the character of a blush that spreads across your face. The condition of your skin in one location is not brought about by its condition in another location, but by internal factors.

The analogy fails, of course, because the mechanisms underlying a blush are naturally understood as vehicles of efficient causation. The picture of the universe I am endeavoring to paint is one in which the universe evolves as it does owing to its being the universe it is, perhaps the only universe admitted by the nature of things. Efficient causation belongs to the manifest image.

Whatever you might think of it, this conception of the universe conforms to the letter, and maybe even the spirit, of the Williams–Lewis universe in which the distribution of qualities evolves over time, but does so not because the qualities themselves interactively necessitate or induce changes or preserve the status quo. Rather the universe is what it is and changing distributions of qualities are simply expressions of its nature, ways it is across the spatio-temporal landscape.

I have taken on board Spinoza's strong necessitarianism without argument, but I find its pull nearly irresistible. This is not because I have Calvinist instincts, but for more pedestrian reasons of the kind in play in Chapters 10 and 11. There I argued that it would be wrong to describe the Williams–Lewis universe, or its contents, as contingent. That universe is what it is and it, that very universe, could not have been otherwise. For Lewis there is a plenum of other universes, each one being as it is of necessity, a kind of profligate Spinozism.

In Williams' case, there is just the one universe, full stop. Could that universe have failed to be, perhaps because another, different universe came to be or because there were no universe at all? For Williams, those would be consistently statable logical possibilities. Once you move beyond a conception of modality exhausted by logical possibility, however, once you accept that genuine possibilities stem from the nature of things, the question whether there are or could have been other universes becomes a big deal.

Although I have characterized Lewis as a kind of profligate Spinoza, profligacy could be avoided by taking up what, in §10.2, I called painless modal realism, a position analogous to Williams' and Campbell's painless realism about universals. If, as I like to think, Lewis and Williams are kindred spirits, it is not altogether implausible to understand Lewis as a painless realist about

both universals and modality. Even if I am wrong about Lewis, the option is open to the rest of us.

Many who oppose the Williams–Lewis Humean agenda do so because they regard it as incompatible with tenets of quantum physics. Quantum physics might be thought to require a kind of top-down, whole-to-part ontology that necessarily eludes a Williams–Lewis ontology. With some trepidation, I take up these topics in the next chapter, arguing that, when all is said and done, a Williams–Lewis—or Spinoza–Williams–Lewis—ontology is in fact better positioned to provide an ontology for quantum physics than its whole-to-part competitors.

13
Reconciliation

Ex umbris et imaginibus in veritatum
(John Henry Cardinal Newman)

13.0 Quantum Ontology

What happens when you confront a Spinoza–Williams–Lewis universe with quantum physics? I am notably ill-equipped to hold forth on the topic unaided, so I shall enlist the help of Michael Esfeld, whose work is representative of one strand of recent attempts to provide an ontology for quantum physics (Esfeld 2020). As will become evident, I go only part of the way with Esfeld (see Miller 2014, 2020).

Before proceeding further, I owe you the reader a word of warning. You only understand something when you can explain it to yourself. I am couching Esfeld's position—and, by extension, the metaphysics I take to be implicit in quantum physics—in my own words. I am in over my head here, so my exposition, in addition to omitting myriad subtleties, is likely wanting in other respects as well. *Caveat emptor*.

Esfeld observes that Newtonian physics and quantum physics share an apparent commitment to action at a distance. What happens here appears to affect what happens elsewhere. Newtonian gravitational attraction is instantaneous and universal. The motion of every particle affects and is affected by the motions of all the others, however far-flung. Gravitational forces diminish over distance, but are never entirely absent. In the case of quantum physics, particles in entangled quantum states exhibit 'non-locality'. Despite the absence of a physical connection, a measurement here affords evidence for a particular result over there.

In neither case are observed correlations among the particles explicable causally. A particle's movement or a measurement here does not, and in fact could not, bring about a particle's movement or a measurement result over there. Rather, the system to which the particles belong evolves in such a way that issues in coordination among distinct states. Although changes here

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reflect changes elsewhere, these are correlations, not instances of genuine action at a distance.

Esfeld embraces a corpuscular universe of insensible particles in motion that would seem sharply at odds with the Spinoza–Williams–Lewis universe as I have characterized it. Once you look beneath the surface, however, matters are not so straightforward.

Esfeld's insensibles are 'point particles' individuated exclusively by their locations relative to one another. A particle has no intrinsic qualitative nature. Its character is exhausted by its spatial location in relation to fellow particles, the nature of which is likewise exhausted by their respective locations. An electron's negative charge, for instance, and the positive charge of a positron are not intrinsic features of the electron and positron. To say that a particle has a negative charge is just to say that it favors one sort of trajectory through the space of particles rather than another.

A Spinozistic universe consisting of a single qualitatively imbued substance—space, or spacetime, or a field, for instance—would be, Esfeld holds, inconsistent with a plausible quantum ontology. Suppose, however, that Esfield's particles were in fact Spinoza's modes, relatively compact, local modifications of the one substance. Suppose, further, that the evolution of the pattern of modes over time were an expression of the nature of the whole they modify. In that case, you would have something paralleling the Esfeld model.

This impression is reinforced when you consider the implications of an account of particles according to which *all there is* to a particle is its location relative to other particles. Esfeld's particles are not indivisible, impenetrable, insensible mobile bits of matter cavorting in a spatial container. Space *is* the particles standing in relations to one another. The particles are just what falls out of the configuration. Particles are not simply individuated—distinguished from one another—by their locations in respect to other particles. A particle's identity, its being the particle it is and its having what it takes to be a particle of the kind it is, is determined, not by its intrinsic qualitative nature—it has none—but by its spacetime trajectory. Only the configuration of particles has what would deserve to be called an intrinsic nature. The configuration is not a configuration of *it*s, the only *it* is the configuration.

So conceived, particles are not substances. God's manufacturing a particle would not be a local punctate affair. God's bringing a particle into existence would require God's rejiggering the whole configuration in a particular way, and it is hard not to comprehend this whole as a something that plays the substance role, the particles being, not parts, but modes, ways the whole is.

13.1 'Where's the Beef?'

So far so good, but a difficulty remains. Spinoza's modes are qualitative modifications of a substance, and Esfeld's particles wholly nonqualitative. Esfeld's universe resembles Roger Boscovich's universe of powers (Boscovich 1763; see Campbell 1976: chapter 6 for discussion). Boscovich replaces classical massy atoms with extensionless point particles. Like Esfeld's particles, these lack intrinsic natures. A material point is a locus of accelerative forces and nothing more. As Campbell explains, Boscovich's material points

> affect the velocities of all others in a single standard fashion which depends only on the distance between them. The effects produced are accelerations. They are either attractive or repulsive depending on the distance separating the points. (Campbell 1976: 86)

Accelerative forces characterizing Boscovich's particles distinguish them from Esfeld's. The trajectories of Esfeld's particles are not a product of forces exerted by the particles on one another. There are no forces, there is no efficient causation. Particle trajectories are expressions of top-down global constraints on particle motions. The nature of a Boscovich particle is exhausted by a pattern of interactions with other particles the nature of which is similarly exhausted by their interactions with other particles. In contrast, the nature of an Esfeld particle is exhausted by its location relative to other particles the nature of which is similarly exhausted by their locations relative to other particles.

Although these are important differences, they elide a more pedestrian worry about the intelligibility of a universe in which something's character is exhausted by its relations to other somethings the character of which in turn is exhausted by their relation to other relationally charactered somethings including the original something. In discussing Boscovich, Campbell puts it this way:

> What are material points made of? They are not made of anything. They do not have any intrinsic features, like mass, or hardness, or solidity, or shape, or size in virtue of which we could give them a nature. Their only feature, other than location, is that they accelerate other points.

Now it is appropriate to ask: so what *are* material points?

> What distinguishes a location in space where there is a point from one where there is no such thing? All we can say is: At a material point there is something which accelerates other somethings which in turn accelerate somethings (including the first) which in turn .... But what an odd object this is; its only feature is to have an effect on things which have an effect on things which have an effect on things which .... We seem to be caught in a regress or circle, forever unable to say just what these things are which have an effect on each other. (Campbell 1976: 93)

How are we to understand *what* is affecting and being affected? Echoing a 1980's Wendy's commercial: 'Where's the beef?'

You might think the question unfair. Confronted with an ontology in which there are no somethings standing in relations, only relations, it would be question-begging to insist on beefy *relata*, relata with intrinsic qualitative natures. Such natures would contribute nothing to our understanding of particle behavior, so why not dispense with them altogether? The burden of establishing the need for qualitative natures falls on the shoulders of those who would insist on such things. The silence of physics on the intrinsic qualitative character of particles does not itself entail that they have none. If qualitative natures contribute nothing to the insensibles, however, why countenance them?

Three reasons spring to mind. First, you might doubt the intelligibility of a purely relational ontology, an ontology in which relata are constituted by relations. This is Campbell's point. You start with a conception of particles standing in spatial relations, then subtract the particles because all physics cares about are the relations, a kind of ontological sleight of hand.

Why not suppose that a particle is not the kind of particle it is because it has the trajectory it has; the particle has the trajectory it has because it is the kind of particle it is. A particle's qualitative nature need not play a causal role in the particle's motions for it to make a difference. Think of sorting different-colored marbles. The red marbles go in this bin, the blue ones in that bin. Your sorting the marbles as you do relies on their colors, but the colors are not themselves causal factors responsible for the marbles' moving from here to there (and not somewhere else). The work is done by the sorter, not by the marbles or their colors.

Second, physics abstracts from objects' qualitative natures, focusing exclusively on what objects do or would do, but this is not a reason to abandon qualities. Doing so would amount to accepting abstraction—partial consideration—as a guide to ontology. All of us, including the physicists,

engage in abstraction in thinking about and explaining goings-on around us. You abstract from a baseball's color when you consider what occurs when the ball is struck by a bat. This affords no reason to think that a baseball could lack a color, much less that it could altogether lack a qualitative nature.

Third, how could a qualitied something—a tomato, a rabbit, the pointer on a dial that indicates the motion of an insensible particle—be wholly made up of mobile nothings? Is it implausible to think that the insensibles have (or are) qualities? Our commerce with the insensibles is exclusively by way of their effects on instruments designed to detect them. It does not follow that all there is to an insensible is its capacity to interact with other insensibles and, given the right setup, trigger a detector. Your not seeing the dog barking outside your window is not to observe a canine absence, and it is certainly not grounds for concluding that the dog is a gratuitous posit, all you need is the bark.

Replacing this causal picture with one in which there are no interactions, only lawful correlations, changes nothing. The thought that the burden of proof lies with the proponent of qualities, has it exactly backwards. Given that there is no reason to doubt that the insensibles have—or perhaps are—qualities, given that the sensibles are, without exception, decked out in qualities, you would need some reason to think that the insensibles, the particles, lack qualitative natures.

A Spinoza–Williams–Lewis universe is formally consistent with the kind of universe described by Esfeld. Substituting modes, qualitative modifications of a lone substance, for particles lacking any qualitative nature whatever enjoys an important advantage. The manifest image is qualitatively saturated. Unless you locate these qualities in the minds of observers, a move of last resort, the prospect of qualitative its made up exclusively of natureless its lacks credibility.

13.2 Priority Monism

Qualitative natures aside, one important feature of Esfeld's approach to quantum physics is widely representative. This is the idea that the best way to accommodate non-locality is to posit properties of systems of particles, holistic properties responsible for configuring the particles. The behavior of a given particle is sensitive to the behavior of fellow particles in a way that excludes ordinary local interactions. The solution is to posit a property of the whole that ensures coordination. The whole takes precedence over its parts.

Jonathan Schaffer is an influential exponent of this picture. According to Schaffer, the universe as a whole is prior to its parts. The whole is fundamental,

the parts are grounded in the whole. Schaffer calls this priority monism and describes Spinoza as a priority monist (see Schaffer 2010: 68–9).

Schaffer distinguishes priority monism from 'existence monism', which 'denies that there are any parts to the whole. Hence it denies that there is anything for the whole to be prior to' (2010: 62). My characterization of Spinoza makes him out to be an existence monist. In aligning Williams and Lewis with Spinoza, I locate them, as well, in the existence monist camp. Is this, as Schaffer contends, uncharitable? What are the untoward consequences of existence monism?

> It seems to me that the priority reading should be preferred to the existence reading if the texts in question can sustain it, on grounds of interpretive charity. After all, Existence Monism is a radical view, conflicting with such seeming truisms as Moore's 'Here is one hand . . . and here is another' (Moore 1939). Not for nothing has monism—when interpreted as Existence Monism—fallen into disgrace. Priority Monism does not conflict with Moorean banalities. It merely entails—sensibly enough—that Moore's hands are not fundamental entities. (2010: 66)

In earlier chapters I distinguished between substantial parts (parts that are themselves substances) and spatial and temporal parts. My contention was that wholes made up of substantial parts were dependent on the parts (in Schaffer's terminology, the parts are prior to the whole). The situation is reversed when it comes to spatial and temporal parts. You need the whole of space to have parts of space, the parts are abstractions from the whole.

In a somewhat different way substances are prior to modes. A mode is a way a substance is, a modification of a substance. You could not have a modification without a something to be modified. If Spinoza is an existence monist, if Spinoza's universe comprises a single substance, what we regard as objects—particles, hands, rabbits, stars—are temporally extended modes, local modifications of the one substance.

Modes are abstract particulars, dependent on and inseparable from the substances they modify. Unlike real accidents, modes could not survive the replacement of the substance they modify (see §3.2). A tomato's redness depends on the tomato and could not exist apart from the tomato. The unit charge of a particular electron could not have been the charge of any other electron. It is the individual charge it is because the electron is the individual electron *it* is.

Schaffer sometimes talks this way, but then is at pains to describe modes as 'proper parts'. This would fit with one version of a Williams–Lewis cosmology according to which the universe comprises qualities distributed in spacetime. These qualities, assuming they are in, not *of*, spacetime, would be candidate proper parts of a whole: the whole would be made up of its qualitative parts.

Treating the qualities this way is to treat them as qualitied somethings, substantial entities, bundles of which make up familiar objects. If this is how it is, there is no sense in which they, the qualities, are dependent on the whole they make up, rather it depends on them. You could render them dependent by making them modes, qualities of spacetime or the universe as a whole, for instance, but then they would cease to be proper parts of spacetime or the universe. My suggestion has been that this way of understanding Spinoza's universe is consistent with the spirit, if not the letter, of a Williams–Lewis cosmology.

In Spinoza's monistic universe, then, and possibly in the Williams–Lewis universe, the universe is prior to its modes, but modes are not substantial parts, not proper parts of the whole they modify. If they were, priority would rest with the parts. If the parts really are parts, they are substantial parts, and it is mysterious how these could be 'grounded in' a 'fundamental' whole which is prior to them.

Am I being uncharitable to Spinoza in treating him as an existence monist? In the passage quoted earlier, Schaffer characterizes this sort of monism as 'a radical view' at odds with there being hands and other Moorean truisms, a view that has 'fallen into disgrace'.

I have spent a good deal of time arguing that the sort of monism I have been ascribing to Spinoza, far from being a radical view, is in fact entirely consistent with the appearances. If Spinoza is right, the truthmakers for 'here is one hand ... and here is another' are not substances or complexes made up of substances, but modes. This is not to eliminate hands, only to say something about the nature of the truthmakers for Moorean truths about hands.

If anyone is being uncharitable, it is Schaffer. Spinoza's modes were, by the seventeenth century, a well-established ontological category deployed, not only by Spinoza, but by many of his contemporaries, including Descartes and Locke. Modes are not parts of what they modify, they are particular modifications of substances. Their dependence on the substances they modify is utterly unmysterious. A tomato's shape and color are no more separable from the tomato than a bump in the carpet is separable from the carpet. To create a tomato's shape and its color, God must create the tomato.

The idea that what we commonly regard as objects—particles, hands, planets—are in fact modes, modifications of a substance, is not to call them into question. It is, rather, to offer an account of what particles, hands, and planets are, the nature of the truthmakers for all those Moorean truths. The account might be wrong, but it is assuredly not a metaphysical outlier, nor is it especially radical. If Schaffer is right in asserting that the account has fallen into disgrace, the disgrace falls to those who so regard it.

13.3 Hume, Spinoza, and Quantum Physics

In discussing Lewis' Humean supervenience, I suggested that the species of supervenience in question is best understood as truthmaking. Lewis' idea, and I believe Williams', is that the four-dimensional array of qualities provides truthmakers for all the truths concerning the universe, including those issuing from the manifest image. I have elaborated the Williams–Lewis Humean picture after the manner of Spinoza, implying that this convergence is inevitable.

The central tenant of the brand of Humeanism in play is the denial of interaction among distinct existences, or, as I would put it, the relegation of interaction to the Manifest image: causal truths are made true by non-causal states of the universe. As I see it, the most promising way to spell all this out is to go with Spinoza and accept that the universe—or spacetime, or a field, or you name it—is an evolving whole. Its evolving as it does is not a product of local givings and takings. The changing pattern of modifications is rather an expression of its nature over time.

As the discussion in §§13.0–13.2 suggests, it could turn out that truthmakers for truths concerning local occurrences at times are not the local occurrences considered individually or in pairs. It might take the whole four-dimensional, temporally extended array of qualities to make a truth pertaining to some local occurrence true (see Miller 2020). The point is one made by the historical Hume in his deflationary account of causation as constant conjunction. The idea that particles are qualities, modes, not substances, would seem tailor-made for a cosmology that honors quantum physics. Non-locality is less puzzling when you see the evolution of the cosmos, not as a venue for interacting bits of matter, but as the unfolding of the cosmos' nature.

Is this just hand waving? Some realists about quantum physics argue that realism is inconsistent with a universe comprising an evolving holistic pattern

of qualities (see, for instance, Teller 1989; Maudlin 1998, 2007). The argument is typically couched as an attack on Lewis' Humean supervenience. The difficulty is taken to stem from the idea that this kind of Humean universe requires that truths about local occurrences are made true by the nature of those occurrences. Realism, they argue, mandates a kind of holism in which the evolution of local arrangements is shaped by the arrangements and not by the arrangements' constituents. The best a Humean can offer is a feeble acknowledgment that the evolution of the arrangement reflects a global rule. This affords no explanation of *why* the arrangement evolves as it does, it is merely to say that it does, and we knew that already.

As Elizabeth Miller observes, this is too quick (Miller 2020). How does saying that the whole shapes the evolution of the arrangement of parts—*somehow*, not causally, but in some explanatorily robust way—enjoy an advantage over its Humean competitor? A Humean says the whole evolves as it does because it is the whole it is. The evolution of the arrangement is an expression of the nature of the cosmos. The cosmos, after all, must have some nature, why not this one?

Really, a Humean, having already moved beyond the thought that the arrangement evolves as it does owing to local causal interactions among its parts, is in a better place than an anti-Humean. The anti-Humean's unacknowledged deference to efficient causation is what makes quantum nonlocality seem to call for some feature of the universe responsible for shaping the evolution of the arrangement. Whatever the shaping amounts to, it is not supposed to be anything like local efficient causation. What is it then? It is *whatever* empowers the whole to configure the parts.

Not only is this no improvement over the Humean's appeal to the nature of the cosmos, it invokes what appears to be an illicit reinstatement of efficient causation in the guise of a whole-to-part configuring property. Refusing to call the configuring a causing is at best unhelpful and at worst disingenuous.

13.4 Unifying the Manifest and Scientific Images

You might not buy this Humean–Spinozistic picture of the universe, but I am not asking you to accept it, only to consider its implications. Consider, in particular the possibility that efficient causation could turn out to belong only to the manifest image, our everyday conception of reality fine-tuned by the sciences, and not to reality as depicted by the eventual successors of quantum physics and general relativity.

What exactly *is* the relation between appearance and reality, between the manifest image and the scientific image? I posed this question in Chapter 1, and the question has reasserted itself again and again in subsequent chapters. I have, in various places, gestured toward what I think the answer should be. Before spelling it all out, it might be worth recalling Sellars' original characterization of the manifest and scientific images:

> The philosopher is confronted not by one complex many-dimensional picture, the unity of which, such as it is, he must come to appreciate; but by *two* pictures of essentially the same order of complexity, each of which purports to be a complete picture of man-in-the-world, and which, after separate scrutiny, he must fuse into one vision. Let me refer to these two perspectives, respectively, as the *manifest* and the *scientific* images of man-in-the-world. (Sellars 1963: 5)

Is the manifest image an illusion or a fiction, useful to be sure, but ultimately untenable? Or is it the other way round: the scientific image erects an instrumentally useful framework for coping with reality as revealed by the manifest image? Or, a third option, perhaps reality is hierarchical: the scientific image provides an account of a fundamental reality, while the manifest image concerns nested less-than-fundamental realities.

I have been pushing you in the direction of a fourth option: the scientific image, the image extracted from physics, affords our best guess as to whatever it is that the manifest image is an image *of*. In earlier chapters, I put this in terms of truthmaking: the scientific image delivers an account of the nature of the truthmakers for truths that have truthmakers.

Many of these truths would belong to the manifest image. When a baseball is propelled into the left field bleachers it is true that the ball moved from the vicinity of home plate, though the air to the bleachers, but the truthmaker for this truth might include nothing that moves, no thing that changes its location over time. That would be so in my imagined Spinozistic universe.

Yet it moves! The baseball's motion is not an illusion. No, this temporally extended wrinkle in spacetime, is what the baseball's motion would *be*. When you point to a baseball in flight, when you record it on your iPhone and post the video on Facebook, this is what you are pointing to, this is what you are recording, this is what you are posting.

Ordinary judgments about baseballs and other creatures of the manifest image are true when their application conditions are satisfied. Such conditions undergird a language tailored to the manifest image. That image takes us to the

universe and facilitates our scientific and day-to-day commerce with it, but it leaves open the nature of what the universe encompasses, its natural ontology.

What goes for motion goes as well for efficient causation. The sun's shining on a tomato causes the tomato to ripen and turn from green to red. But the truthmaker for this causal judgment might, for all we know, include no bringings about, only the evolution of the universe as expressed by its assorted modes. If you accept a Cartesian/Spinozistic ontology of substance and mode, and you regard objects—electrons, baseballs, tomatoes, planets—as modes, truths about causal relations among such things survive unscathed, although the picture emanating from the scientific image, could, in the end, be one in which efficient causation is entirely absent.

The idea of causal relations among modes is, at the very least, out of keeping with the relation modes bear to one another and to the substances they modify. In a Spinozistic universe, truths concerning causal relations among objects are made true by the way the universe as a whole unfolds over time, a depiction that evokes my favored interpretation of the Williams–Lewis universe.

In some respects, the important distinction is that between a conception of the scientific image as revealing what the manifest image concerns, and a conception of the relation between the two images according to which science, or physics, or physics in concert with metaphysics, reveals the nature of some fundamental reality, while the special sciences, together with our ongoing encounters with the universe, provide information about less-than-fundamental, derivative, dependent sorts of reality.

With Williams, Lewis, and Spinoza, I accept a 'flat' universe. There are dependence relations—modes depend on substances they modify—and, at least in the manifest image, part–whole relations. But, in a Williams–Lewis–Spinoza universe, wholes, other than the universe itself, are just their parts related as they are, the parts belonging to the manifest image. No collection, no whole, is privileged and wholes are no less 'fundamental' than their parts. If you have the parts, if you have these very parts just as they are, you have these wholes.

Some wholes, some collections, answer to terms or concepts fashioned for use in the manifest image, most do not, most would strike us as beneath consideration. Although our commemorating some collections and not others is in an obvious sense mind-dependent, the collections are not thereby rendered mind-dependent. They would be on the scene even if we were not.

Once you move to the scientific image, talk of wholes and parts in a Spinozistic context would have no application. The parts are not substances,

the wholes are not complexes made up of substances. There is but one substance variously attributed. Ways of being thus attributed, modes, are not proper parts of the substance, they do not make up, and certainly they do not causally interact with, the substance any more than a concentration of mass or energy in a field is a component part of, or causally interacts with, the field. The field and its modifications are not distinct existences.

You could, of course, accept that the scientific image gives us an account of what the manifest image is an image of, without going all the way to Spinoza. Even so, it is surely of interest that Spinoza lies at the end of what would on the face of it appear to be very different paths. Physics might turn out to push us toward Spinoza, but so would the picture offered by Williams and Lewis, and so would an Aristotelian universe of stuffs of the kind described in Chapter 9.

13.5 Appearance in Reality

My foray into speculative cosmology will have succeeded if I have managed to create doubts about the viability of a bare, pluralistic brand of Humeanism and the inevitability of a competing layered conception of reality, according to which, various ways of thinking and talking about the universe are taken to concern distinct realities, some grounded in others.

The layered universe is thought to be a consequence of the incommensurability of taxonomies we deploy in everyday life and in the various sciences. Suppose it is true that you could not replace talk of psychological, biological, or even chemical phenomena, with talk of particles and fields, or derive truths about the former from truths about the latter. From this, it does not follow that psychological, or biological, or chemical phenomena are ontologically distinct from, but in some fashion dependent on, the particles and fields, the particles and fields being more fundamental.

Our taxonomies circumscribe portions of the universe, the nature of which, as far as anyone knows, could turn out to be almost anything. Ontology aspires to an accounting of the most general features of reality—placeholders—leaving it to physics to furnish details as to their makeup. Most of us, most of the time, are oblivious to, and so care nothing about, these details. We rest content with more accessible, ready to hand depictions. The taxonomies we put to use in describing and explaining our surroundings are designed to 'carve reality at the joints'. But reality, as Williams notes, has endless joints and admits endless carvings. You might think of physics as searching for joints that admit of no further joints.

The business of physics is that of delivering an accounting of the nature of the truthmakers for truths at home in the manifest image. The story we have from physics is not the only story, however, not necessarily even the best story. If we want to understand tomatoes, we turn to biology and botany not to quantum physics or general relativity. We invoke biological taxonomies in ascertaining what makes tomatoes tomatoes. But every tomato is, as it happens, a collection of particles, or a disturbance in a field, or something more exotic still. This is what you point to when you point to a tomato, this is what you throw at politicians, what you grow in the garden, slice up and cook for breakfast. This is what makes all those biological, horticultural, and quotidian truths about tomatoes and their antics true.

13.6 Coda

> There remains the final reflection, how shallow, puny, and imperfect are efforts to sound the depths in the nature of things. In philosophical discussion, the merest hint of dogmatic certainty as to finality of statement is an exhibition of folly.
>
> A. N. Whitehead 1929: x

Although I am partial to it, I have not set out to defend a Spinozistic cosmology, only to call attention to the fact that there are many routes to such a cosmology, including, surprisingly, one that begins with the kind of Humeanism embraced by Williams and Lewis. If nothing else, a cosmology should be prepared for any eventuality that might be thrown at it by physics. On this score, at least, a cosmology erected on a substance–mode ontology has a distinctive appeal. Should evidence for a physics of fields, or a unified field, or a textured spacetime accumulate, the ontology provides the resources for a reconciliation of the manifest and scientific images. In this regard, it enjoys advantages over ontologies committed to one or another form of corpuscularism.

One defining feature of the ontology that would be easy to lose sight of is the idea that properties, the modes, are qualitative natures, something front and center for Williams and Lewis. Physics abstracts from qualitativity, focusing on quantitative aspects of the universe. In a pluralistic universe of particles, this would mean working out what, owing to their qualitative natures, the particles would do in concert with fellow particles. It would be a mistake, however, to interpret silence on the part of physics concerning qualities as

constituting a denial of qualities. As Eddington observes, 'science ignores what anything is in itself' (Eddington 1928: 257).

In arguing that physics gives us an accounting of the character of the truthmakers for truths of the manifest image, then, I do not mean that physics is exhaustive, and I most emphatically do not mean that all the truths are expressible in the vocabulary of physics. Physics is but one voice among many. It would be a mistake to think that, when physics has had its say, there is nothing more to be said. It would be no less a mistake to think that the 'more' here concerns something *in addition*.

Finally, it should be clear that talk of the scientific image is offered as a placeholder for whatever reality turns out to be: a One, a Several, a Many. Whatever it is, it makes true whatever is made true, including all our qualitative talk about tomatoes, rabbits, planets, and water, as well as our talk about our own and others' conscious experiences of tomatoes, rabbits, planets, and water.

14
Agency

> Behold, there went out a sower to sow; and it came to pass as he sowed, some fell by the way side, and the fowls of the air came and devoured it up. And some fell on stony ground, where it had not much earth; and immediately it sprang up because it had no depth of earth: but when the sun was up, it was scorched; and because it had no root, it withered away. And some fell among thorns, and the thorns grew up and choked it, and it yielded no fruit. And other fell on good ground, and did yield fruit that sprang up and increased; and brought forth, some thirty, and some sixty, and some an hundred.
>
> *Mark 4*: 3–8

14.0 The Antinomy of Agency

This chapter was inspired by Peter van Inwagen's 'Some Thoughts on *An Essay on Free Will*' (2015). We are poles apart philosophically, but I take seriously van Inwagen's insistence that affirmations of free will in the face of evidence that our choices stem from factors beyond our control are unsustainable.

Van Inwagen's paper is a meditation on his earlier *Essay on Free Will* (1983), a milestone in the contemporary debate over the nature of free will. The problems he addresses in the *Essay* echo perennial worries that, in one form or another, continue to exert a powerful influence on the philosophical imagination. I am an outsider when it comes to the free will debate. If van Inwagen is right, however, if discussions of free will have degenerated into a species of 'sterile scholasticism', the only hope of progress lies in the contribution of some outsider—even if, as is almost certainly the case, I am not that outsider.

In earlier chapters I defended the thesis that the scientific image, in the guise of physics, poses no imminent threat to the manifest image: the scientific image provides an accounting of the natural ontology of truthmakers for deliverances of the manifest image. We can be deceived by appearances,

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subject to assorted illusions, bark up the wrong tree, be victims of superstition and false testimony. Even so, many of the judgments we make in the course of pursuing our everyday and scientific ends are plainly true. These judgments make no pretense of uncovering the deep story about what they concern.

I propose now to examine the implications of this way of thinking about the relation between the manifest and scientific images for the longstanding philosophical debate over agency and free will. On the one hand, we seem bound to accept that we are accountable, morally and otherwise, for at least some of our actions, those arising from free choices. On the other hand, accountability is apparently at odds with physics, which would seem to make who we are and what we do, including the choices we make, dependent on factors over which we have no control.

Kant's Third Antinomy portrays the problem vividly:

> *Thesis*. Causality in accordance with laws of nature is not the only causality from which the appearances of the world can one and all be derived. To explain these appearances it is necessary to assume that there is another causality, that of freedom. *Antithesis*. There is no freedom; everything in the world takes place solely in accordance with laws of nature.
>
> (Kant 1787: *Third Antinomy*)

Any invocation of Kant brings with it an air of gravitas, but my objective here is not to advance a solution to the debate over the possibility of free will. The goal, rather, is to illustrate how confusions over the relation between the manifest and scientific images permeate philosophical discourse. In so doing, I shall be putting my characterization of the manifest and scientific images to the test. The best measure of a hypothesis is its capacity to handle hard cases. 'Wherefore by their fruits ye shall know them.'

Astute readers will have already guessed where this is going. Tables, tomatoes, planets, and sentient creatures, including agents choosing freely, are staples of the manifest image. The scientific image, drafted by physics, illuminates the nature of individual tables, tomatoes, planets, and sentient creatures without casting their reality into doubt.

This could sound like a feeble version of Kant, but in reverse: free will belongs to the realm of appearances, not the realm of things-in-themselves. Or it could be dismissed as just another species of 'compatibilism': free will and determinism are compatible. I believe it is neither. Everything turns on how you understand the relation between the manifest and scientific images.

My motivation for interpreting that relation as I do has nothing to do with a desire to bolster free will. I would not regard its failure to resolve the problem of free will as a reason to abandon it. But understanding the relation as I recommend opens up one kind of response to the problem without compromising either agency and responsibility or a commitment to taking physics at its word.

Too good to be true? You be the judge.

14.1 The Necessitarian Foil

In Chapters 12 and 13 I explored the possibility that, for all we know, the universe as revealed by physics could turn out to resemble Spinoza's universe. The objective was not to promote a Spinozistic ontology, but to convince you that it is a surprisingly short step from the kind of unrelenting Humeanism promoted by D. C. Williams and David Lewis to Spinoza. A second objective was to inspire you to ask yourself what the implications of such an ontology would be for what we accept as comfortable truths of the manifest image.

The Spinozistic option could be viewed as a kind of worst case outcome for the manifest image. A pluralistic universe in which particles darted about in space and conspired to make up atoms, molecules, tables, and rabbits preserves objecthood all the way down. In contrast, were the substances to turn out to be the fields, say, or a unified field, or space, or spacetime, or the cosmos as a whole, what we regard as concrete objects would be modes, modifications of the fields, or the one field, or space, or spacetime, or the universe itself. Objecthood as we commonly understand it would be relegated to the manifest image, the realm of appearance.

My contention was that this would by no means discredit familiar objects, it would instead reveal an antecedently surprising truth about objects, namely that they are modes, not complexes made up of substantial parts. The truth would be surprising, however, only in the sense that it is at odds with a more familiar corpuscular conception of the universe. It would certainly not be at odds with the appearances. It would reveal the nature of what appears.

Whether objects turn out to be assemblages of particles, or configurations of fields, or something hitherto unimagined, the appearances remain on the scene. They remain on the scene, not as higher-level items distinct from but dependent on something more fundamental, but as what they are: assemblages of particles, or modes, or whatever physics says there is. The sciences, and especially physics, are to be regarded as disclosing the nature of whatever

populates the manifest image, not as exposing the populace as imposters or metaphysical freeloaders.

You might take all this in your stride, regarding it as relatively uncontroversial. What I suspect is much more controversial is the undercurrent of necessitarianism that has emerged in the discussion. No one would find it surprising to see a cosmology pegged to Spinoza as necessitarian. So much the worse for Spinoza! Yoking Williams and Lewis to Spinoza, however, broadens the field. Indeed, if you share my reservations about brute facts, the field is broader still. Contingency is more elusive than is commonly supposed. Indeed, whatever the natural ontology turns out to be, whatever the physics, it is hard to avoid the remarkable thought that necessity, not contingency, has the upper hand.

This prospect, far-fetched as it might appear, has always been respected by philosophers and really by anyone who has ever thought seriously about free will, anyone who has ever pondered agency and responsibility. The inescapable question on the table is whether physics poses a threat to human agency. Given my views on the relation of the scientific image, the domain of physics, to the manifest image, the point would seem to be especially pressing. Whatever else we are, we are embedded in the universe. If physics tells us what individual molecules, tables, and rabbits are, it tells us what we are.

By now it should be clear that this is not the reductionist claim that all there is to know about the universe is revealed by physics. To say what needs to be said about ourselves and our circumstances we need, in addition to physics, biology, anthropology, psychology, poetry, dance, and probably even philosophy. When it comes to questions about free will and responsibility, however, physics muscles back into the picture. If physics calls the shots, how could we possibly be said to be agents, how could we possibly be thought to choose freely, how could we ever be held responsible for anything we have done?

14.2 Making Room for Agency

One place to start would be with an account of the essence of agency. You grasp something's essence when you have some understanding of what it takes to be the kind of something it is. So, what is the essence of agency, what would it take for you to be an agent responsible for your actions?

Some philosophers hold that what you grasp when you grasp something's essence could be expressed in a 'real definition'. The idea is that an appreciation

of what it takes for something to be a tree, or a baseball, or an agent could be spelled out in a real definition.

I have resisted talk of real definitions on the grounds that such talk could lead to the mistaken thought that essences are creatures of language or convention. Setting that worry aside, it would be incredible if the real definition of tables, trees, and rabbits excluded tables, trees, and rabbits. Assuming they capture what we grasp when we grasp what it takes to be something—a table, a tree, a rabbit, an instance of agency—the vocabulary in which a real definition is expressed would seem to be tailored to the manifest image.

So long as a real definition of agency, a specification of what it takes to be an agent, were couched in an idiom integral to the manifest image, it would leave open the nature of the truthmakers for individual instances satisfying the definition. Should anyone care, this would be supplied by the scientific image, and eventually by physics. Suppose that agency, real agency, requires that an agent's free choices are not products of factors outside the agent's control: agents, *qua* agents, are autonomous. Some such condition lies behind much of the current debate. Is this condition ever satisfied?

Many doubt that it is. Psychology affords ample evidence that we are subject to myriad unconscious influences and biases. Subjects who take themselves to be choosing freely are in fact at the mercy of unacknowledged and often self-serving psychological forces (Trivers 2011 provides an extensive catalogue).

This research, however deflating and however much it reveals about the extent to which we lack insight into the bases of our decisions, is not by itself sufficient to undermine the idea that we are agents who do, on occasion, act freely, at least in the sense that we are accountable, practically and morally accountable, for our actions. Agency and responsibility can be fleeting or robust. What psychological research reveals, if it reveals anything, is not that our choices invariably stem from factors beyond our control but that our insight into these choices is less reliable than we might have hoped.

What of neuroscience and experiments purporting to show that conscious choices merely accompany, but do not produce actions? (See Mele 2011 for a succinct discussion of the literature.) Even if you thought neuroscience posed no threat to agency, however, you might still worry that the physical sciences do. Indeed, my impression is that the really serious challenge to agency and free will is thought to emanate from the physical sciences, physics in particular.

One response to the threat posed by physics would be to argue that agents' choices might somehow elude physics. This is how 'libertarians' see it. Aquinas puts it this way:

> The philosopher says: According as each one is, such does the end seem to him. But it is not in our power to be such as we are, for this comes to us from nature. Therefore it is natural for us to follow some particular end, and therefore we are not free in so doing....

Rather than concluding that we do not choose freely, however, Aquinas turns aside from the consequences:

> I answer that, Man has free choice, or otherwise counsels, exhortations, commands, prohibitions, rewards, and punishments would be in vain.
>
> (Aquinas, *Summa Theologica* I, q. 83, obj. 5)

The philosopher's *modus ponens*, is Aquinas' *modus tollens*.

If ignoring physics is not just a matter of whistling in the dark, might there be some way for the mechanisms underlying free choices to find their way into physics? The possibility cannot be ruled out in advance, but the prospects are not encouraging. As physicist, Carlo Rovelli, observes:

> There is nothing about us that can escape the norms of nature. If something in us could infringe the laws of nature, we would have discovered it by now. There is nothing in us in violation of the natural behavior of things. The whole of modern science—from physics to chemistry, and from biology to neuroscience—does nothing but confirm this observation.
>
> (Rovelli 2016: 72–3)

14.3 The Shadow of Physics

Start with the idea that we are made up of billions of particles, all subject to natural law. It would seem, then, that what we do—how we reason, what we think, and how we decide—is determined by impersonal forces acting on particles or organized collections of particles, forces stemming ultimately from factors wholly beyond our control. Some occurrences inside our bodies might result from uncaused causes, spontaneous goings on in the particle realm, but it is hard to see how these could be especially relevant to agency and free will.

The problem is nicely captured in van Inwagen's consequence argument:

> If determinism is true, then our acts are the consequences of the laws of nature and events in the remote past. But it is not up to us what went on

> before we were born, and neither is it up to us what the laws of nature are. Therefore the consequences of these things (including our present acts) are not up to us. (van Inwagen 1983: 16)

The consequence argument is meant to show that determinism and free will are incompatible. You can appreciate the force of the argument by taking seriously the idea that your choices are expressions of your nature at the time of your choosing. Were the universe deterministic, your nature would be what it is owing to factors over which you have no control. Your choices are expressions of your nature, however. So, if determinism were true, your choices would not be free.

Determinism is not solely the issue, however. If van Inwagen's point holds, it holds whether or not the universe is deterministic. Mixing in spontaneous occurrences of the sort you find in the decay of unstable elements tempers, but does not eliminate, the queasiness elicited by the consequence argument.

Suppose that, to count as free, an action must be uncoerced, the action must be *spontaneous*, a high bar. When you look at yourself through the lens of physics, however, you might see collections of particles caught up in causal matrices that extend outward and backwards in time. If this is what you are, then in what sense could anything you do be spontaneous? In what sense could you ever be genuinely in control of your actions? In what sense could you ever be said to be responsible for what you do?

Even in cases in which you take yourself to initiate actions, these actions are the expression of your condition at the time they were contemplated and performed. Causes of that condition are outside your control. Your choices are intermediate nodes in causal networks in which your actions are embedded. Hence, the problem of free will.

True, physics gives us reasons to think that some occurrences *are* spontaneous, uncaused by prior occurrences. When a radium atom decays, its decaying is uncaused. In decaying, the atom acts spontaneously. The atom acts as an unmoved mover. Perhaps this kind of fundamental spontaneity could be exploited in the service of an account of agency.

Many philosophers and non-philosophers have weighed in on this topic. Some, the compatibilists, worry that, were actions uncaused, were actions spontaneous on the model of the decay of a radium atom, they would be merely 'random'. Leaving aside the provenance of agents' interests and motives, uncaused choices or decisions would not be genuine expressions of those interests and motives, not be actions for which agents could reasonably

be held accountable. So, were a choice or an action uncaused, were it the result of a genuinely spontaneous occurrence, its author could not be held accountable for performing it.

On the other side, incompatibilists argue that actions stemming from agents' membership in the causal matrix, even a matrix that includes spontaneous elements, are not compatible with agency and free will. You must choose either to accept free will as an illusion or allow that agents somehow elude the causal flux, perhaps by rising above it. The first is not an option anyone could ever have reason to accept: it is at odds with the very idea of rational acceptance. The pressure is on to adopt a conception of agents as special kinds of entity. Perhaps agents can affect the universe directly by means of a *sui generis* species of causation, 'agent causation'. Or maybe agents are nonphysical Leibnizian monads forever acting without being acted upon.

14.4 The Levels Option

A different kind of response to the threat posed by physics invokes levels of being. At the basic level are the particles and fields of fundamental physics. At a higher level are the molecules, including organic molecules encompassed by chemistry. Biology, neuroscience, and psychology concern successively higher levels.

The resulting picture is hierarchical: higher-level entities and processes, although in some manner dependent on lower-level entities and processes, are autonomous, not reducible or explicable by reference to entities and processes at lower levels. As noted in earlier chapters, a currently popular idea is that higher-level items are realized by items occupying lower-levels, although there is little agreement as to the nature of the realization relation.

With a thesis of this kind in hand, you might endeavor to explain how psychology could be autonomous with respect to neuroscience, chemistry, and physics. Psychology concerns a realm of entities and processes that persists on its own, a realm of entities and processes dependent on, but not reducible to, entities and processes that concern neuroscience, or chemistry, or physics.

This might be thought to leave open the possibility that agency and free will pertain to higher-level entities and processes of no concern to neuroscience, chemistry, or physics. And this in turn might suggest that attempts to undercut agency and free will by appeals to lower-level physical sciences are misguided, the arguments beside the point.

Whatever your attitudes toward agency and free will, you will be all too familiar with this hierarchical picture of the universe. I have insisted that the picture is massively defective, that it results from reading linguistic or taxonomic categories into ontology. From the apparent fact that psychological or biological principles and categories cannot be systematically reconstituted as principles and categories deployed in physics, it does not follow that these principles and categories pertain to distinct kinds of entity occupying distinct levels of being. There is one universe, describable in the language of physics. The very same universe, or portions of it, could be described biologically or psychologically, employing categories orthogonal to those of physics.

Even if you were comfortable with a hierarchical depiction of the universe, however, you would not be off the hook when it comes to agency. Presumably, states of mind would be on the scene because their realizers are on the scene: you are in a given psychological state, ψ, because you are in a particular physical state, ϕ, that realizes ψ. Suppose that ψ is your choosing to stroll and, on the basis of that choice, you subsequently stroll: your body moves in a particular way. What brought about your strolling? Was it ψ, your choice, or was it ϕ, ψ's physical realizer?

There are many reasons to think that, given its higher-level status, ψ would be causally screened off from the production of physical effects. The difficulty is one recognized even by proponents of the hierarchical picture. All of this is just to say that a layered, hierarchical conception of the universe brings no relief from the problem of free will. If taking refuge in the possibility that human beings generally, and agents in particular, belong to a higher-level, explanatorily autonomous, ontological order is no help, however, what other options might there be?

Return to the Aristotelian idea that objects behave as they do because they are as they are. A baseball rolls and makes a circular concave impression in the turf because it is spherical. Unlike baseballs, agents can originate, or initiate actions. Think of a seed's sprouting as described by Mark in the epigraph that introduces the chapter. The sprouting occurs when powers latent in the seed act in concert with powers present in sunlight and moist soil. Similarly, an agent's acting encompasses the exercise of powers possessed by the agent's nervous system that, in the agent's circumstances, can result in bodily motions. Agents, in common with other entities, do what they do because they, and their circumstances, are as they are.

But now, the awkward question. How could agents truly be responsible for acting if they are not responsible for being as they are? This is the sticking point. This is what leads some philosophers to insist that real agents would

have to be unmoved movers capable, not only of initiating causal sequences, but capable as well of freely making themselves themselves.

The unsavory character of this kind of bootstrapping is what leads other philosophers to deny free will or agency, or argue that it is an illusion, albeit one that appears adaptive, one that we should be hard pressed to abandon, hence the problem of free will. The passages from Aquinas exemplify the dilemma (see Strawson 2002; Pereboom 2002; Smilansky 2002).

14.5 Three Approaches to Agency

Like Aquinas and van Inwagen, most of us most of the time find it hard not to believe that we human beings sometimes act freely. When we do, we can reasonably be held accountable for what we have done. We are agents responsible for our acts, or some of our acts.

Here, a prefatory note is in order. I shall use 'agency' throughout to mean 'free agency': agents, *qua* agents, act freely. I shall assume, as well, that ascriptions of agency are often enough unproblematically true, that our status as agents is not doubtful or illusory. My focus will be not on the question *whether* such ascriptions are occasionally true, but on the question what the constraints might be on whatever makes them true if and when they are true.

Although I believe we sometimes act as agents, I accept that in any particular case this assessment could be mistaken. An apparent case of agency could turn out, on closer inspection, to be merely apparent. On the whole, however, we are competent judges of agency. Our grasp of the essence of agency, our understanding of what it would be to be, what it would take to be, an agent liable to practical and moral assessment, equips us to identify cases in which we and others act as agents, cases in which actions are performed freely.

What I reject is the idea that we are in a position to ascertain or dictate the nature of the truthmakers for particular ascriptions of agency—or, for that matter, anything else—from the armchair. We have no difficulty in identifying tables and distinguishing tables from saucepans and bars of soap. We are not infallible. Sometimes we are fooled by our senses or by cleverly contrived counterfeits. Reasonable people could disagree over whether something is a table or a shelf.

Our understanding of what would count as a table takes us *to* particular tables, but leaves their individual natures open. For all you know, the table you recently purchased from Ikea and struggled to assemble in your kitchen is a cloud of particles, or a disturbance in a field. In the same way, our

understanding of what agency requires leads us with fair reliability to instances of agency, but does not thereby reveal the instances' underlying character.

What is at stake? Suppose I am right, suppose discussions of agency have been hobbled by attempts to move from an appreciation of what would count as an instance of agency or free will to conclusions concerning the nature of truthmakers for particular ascriptions of agency. When these, combined with a smattering of physics, appear to make agency or free will unlikely or impossible, three kinds of reaction are common (slippage at work).

(1) Physics establishes that agency and free will are illusions: get over it! ('hard incompatibilism')
(2) Agency and free will are givens; we must adjust our cosmology accordingly and not be intimidated by physics ('libertarianism')
(3) A choice brought about by factors over which the agent has no control can, nevertheless, be free ('compatibilism')

My contention is that all three kinds of reaction are ill-considered. All three turn on a flawed conception of the relation between the manifest and scientific images, a conception that places the two in competition. Instead, our grasp of what it takes to be a table or an agent acting freely puts us in touch with tables and agents, but, in most cases, leaves their nature opaque and unresolved. Settling on the truths is not to settle the character of the truthmakers, the character of whatever makes truths we accept true, what is encompassed by the scientific image, what is revealed by physics. But, as I have argued at length—or at least asserted repeatedly—physics does not compete with or undertake to supplant the manifest image, it gives us a glimpse of the nature of what the manifest image is an image of.

14.6 Trees, Baseballs, and Agents

You might demur, noting that ordinary conceptions of agency and free will, the deployment of which lead us to exemplary cases, include various elements: spontaneity, for instance, or perhaps selective gaps in causal networks issuing in actions. Let that be so. It does not follow that this has very much at all to do with what physics tells us about the character of individual actions we readily, albeit fallibly, identify as paradigmatically spontaneous or free.

I appreciate that this sounds paradoxical. Am I saying that the truthmaker for 'Donald's action was spontaneous' could turn out to be something altogether nonspontaneous?

Yes.

Take trees. Outside of the philosophy seminar room, it is uncontroversial that there are trees. But the question, 'What are trees?', has more than one answer. In addition to our ordinary grasp of what it takes to be a tree, we have specialized botanical definitions and taxa. When, in a particular case, these are satisfied, we are happy to accept that the something that satisfies them is a tree. But what is the something? Yes, it is a botanical entity with assorted botanical features, a respectable occupant of the manifest image. But what are individual entities with these features? What is the nature of individual trees?

This might seem an odd question, but a moment's thought reveals that it is inevitable. Here is a tree. The tree answers to various everyday, horticultural, and more specialized botanical descriptions. But what is the nature of the truthmakers for these truths? The tree might be an unimaginably complex, organized, dynamically evolving swarm of quarks and leptons, each with a particular history, each interacting in a sea of energy with its fellow quarks and leptons and with quarks and leptons not belonging to the tree. Or the tree might turn out to be a multifaceted throbbing disturbance in a field, or a wrinkle in spacetime.

At present, what the tree—*this* tree—is, remains unresolved. Various options are in play. The important point is that none of these options in any regard compromises the standing of the tree or renders ordinary and botanical claims about the tree false or provisional. This tree is what it is and not another thing, although what it is remains an open question.

This in no way slights botany or, for that matter, forestry or horticulture. Botanical truths are botanical *truths*. There is no hope, and certainly no point, in seeking to replace botany with physics or attempting to extract botanical truths from truths couched in an elementary physical vocabulary. Botany has a lot to tell us about trees, a lot to which physics is indifferent. Botanical conditions delineate the trees, botanical conditions present us with trees, but the character of their individual natures is something discoverable, if at all, in the pursuit of physics. What would be a mistake would be for botanists to insist that for something really to be a tree requires that the botanical conditions for treehood are the last word on whatever has what it takes to be a tree.

As with trees, outside the philosophy seminar room we understand what would count as an instance of agency well enough to be able to single out

particular cases. We are by no means infallible. You might regard an action as free that turns out, on closer inspection to have been subtly coerced. Some things you take to be trees could turn out not to be trees. In the supermarket tomatoes are situated amongst the vegetables, but botanists tell us that tomatoes are fruit. We could, in any given case, be off base.

Another example deployed earlier concerned moving bodies. The movement of a cursor across a computer monitor amounts to a sequence of immobile pixels turning on and off. It would be a mistake to describe the cursor's motion as illusory or as a mere appearance, however. No, this is what it is, this is what it takes, for a *cursor* to move: this is the nature of cursor motion.

Now consider the motion of a baseball hit by Albert Pujols into the left center field bleachers. For all we know, the motion of the ball could turn out to be analogous to your cursor's motion: a pattern of disturbances in spacetime perhaps. In that case, would it be false that Pujols hit the ball into the bleachers? Would the ball's flight have been illusory?

Why would anyone think that? The baseball's sailing into the stands was, after all, observed by thousands of spectators, broadcast on television, and resulted in a spectator's being concussed after being struck by the ball on its descent. That is what it is for a baseball to move. Yet truthmakers for truths about the motion of baseballs could, for all we know, turn out to include nothing that moves.

This is the attitude we should take up toward agency and free will. At present, we have no idea what the nature individual human agents as revealed by physics is going to turn out to be. Excluding fanciful possibilities involving Martian implants, Evil Demons, Matrix situations, elaborately staged holograms, and the like, whatever it proves to be, it should be regarded, not as threatening, but as illuminating the nature of the truthmakers for particular ascriptions of agency.

Philosophers can analyze talk of agency to their hearts' content, they can explore, by whatever means, what would count as an instance of agency. Doing so could well serve to clarify or refine our implicit understanding of agency and responsibility while leaving open the question: what is the nature of the truthmakers for particular ascriptions of agency? What would be a mistake would be to imagine that analyses or explications of what it takes to be an instance of agency serve to augment or constrain what physics tells us about what each of us is.

Suppose, as would seem inevitable, that the final, but certainly not the only, reckoning about trees and moving baseballs is in the hands of the physicists,

whose job it is to circumscribe the nature of the universe, its occupants, and their antics. Why imagine it is any different with agency and free will? Leaving accounts of individual agents and their choices to the physicists is no more a threat to agency and responsibility than nodding to physics would be a threat to trees or baseballs in flight.

If you find this picture unpersuasive, I invite you to offer your own account of the relation the various sciences bear to one another and to our ordinary beliefs and experiences. In any case, I have promoted these ideas at length already, and I shall be assuming them here. Applied to agency, the thought is that philosophers, in discussing free will, have wrongly taken our ordinary grasp of agency, our grasp of what it takes to be an agent, to constrain the physics of individual human actions, the nature of the truthmakers for truths concerning instances of agency.

In each case you could start with exemplars: exemplary trees, for instance, and exemplary instances of agency. Your ability to identify these reflects your understanding of what it takes to be a tree or an action. This leaves open the details of the physical makeup of individual trees and agents. Individual trees and agents are what they are, the makeup of each of these is what it is, and, given what we now know, that makeup could turn out to be almost anything at all.

Van Inwagen objects to appeals to exemplars in arguments purporting to show that free will is compatible with determinism (1983: 106–14). The idea is that you could appear to satisfy all the conditions for agency and yet not be an agent. This might be so, van Inwagen observes, had you been programmed by Martians. The Martians implant a device in your brain that causes your choices to be the choices they are. The device is undetectable 'by any observational technique we have at our disposal' (109). You appear perfectly unencumbered, even to yourself, and so appear to, but do not, have what it takes to be an agent. Yes, and we could all be in the Matrix. Trees might only be illusions induced by the Evil Demon.

The mistake would be to imagine that we must solve these problems before deciding what it would take to be a tree or to act responsibly. I shall say more about what it takes to be an agent in due course, but in the meantime it seems clear that the presence of an implanted device that places you under the control of Martians would indeed undermine your agency. The question is whether this case is relevantly similar to one in which ordinary people act in ways that satisfy requirements for agency, while the nature of the truthmakers for the ascriptions are deterministic. I hope you agree that it is not.

14.7 Seeds of Agency

How then are we to think about agency and free will? Consider moral agency and responsibility. Most, if not all, human beings are from birth equipped so as to be educable and receptive to becoming moral agents, agents responsive to reasons, motivated, on occasion, by moral considerations. Given the chance, some agents, like seeds sewn in good soil, take on a moral character. Such agents can be held fully accountable for at least some of their actions. Others, however, lack the requisite conditions (some seeds are barren), others are deprived of the opportunity (some seeds fall on stony ground), and still others are corrupted by their circumstances (some seeds yield sprouts that succumb to thorns or overwatering). Life is not fair. In such cases, we withhold ascriptions of agency or mitigate agents' responsibility.

With the usual caveats, agents, like seeds, are not, or not entirely, responsible for their nature or their circumstances. We are assembled from the same raw materials as everything else and subject to the same impersonal forces. We accept this, but accept, as well, that some of us some of the time act as agents accountable for what we do—we have no choice!

Is this what Derk Pereboom (2002) calls 'hard incompatibilism'? Does it effectively abolish agency and free will? If not, is it yet another weasely form of compatibilism, one that altogether fails to address serious tensions inherent in our conception of responsibility coupled with an unseemly deference to physics?

No. We have as much reason to believe in free will as we have to believe in tables, trees, and rabbits. The mistake is to imagine that physics compromises tables, trees, rabbits, and agency or that what it takes to be a table, tree, rabbit, or agent places constraints on the nature of the truthmakers for truths concerning tables, trees, rabbits, and agency.

Return to the cursor moving across your computer monitor. I proposed that in this case, the right thing to say is that the cursor moves, but the truthmaker for this assertion is a dynamic process involving no moving parts, only patterns of successive pixel illuminations. Cursor motion apparently differs from the motion of baseballs. Still, the physics of moving baseballs could turn out to be analogous to the physics of moving cursors. The truthmaker for the assertion that the ball sails over the fence could, for all we know, turn out to be nothing that moves, no lump of matter that occupies successive regions of space at successive moments leaving behind vacated regions. The truthmaker could be a ripple in a field or in spacetime itself, something closer to a shiver running down your spine. Still, the baseball sails over the fence.

You could deny this. You could say that, were the universe as depicted by Spinoza, and perhaps by Williams and Lewis, nothing moves. So to discover that the universe is this way would be to discover that moving baseballs, along with moving cursors, are only illusions. Mother Nature can do what no pitcher could hope to do: render every batter hitless!

Such a response betrays confusion over the relation the manifest image bears to the scientific image. In spelling out what it takes to be a baseball in motion, we draw on the manifest image. When these conditions are satisfied, you have a moving baseball.

We become adept at identifying moving objects by attending to instances. Pointing to the baseball in flight, you say, '*That* is moving'. Now, the physicist steps in and provides an account of what *that*, the baseball's moving, amounts to. The physicist explains what the baseball's sailing over the fence *is*. It would be true that the baseball sails over the fence, even if the truthmaker for this truth included nothing that moved.

This is not to say that physics is the royal road to truth. There are endless ways to describe—truly describe—the universe and goings-on in the universe. These ways serve all manner of different purposes. The job of physics is to get to the bottom of things, to give us insight into the nature of the truthmakers for truths that have truthmakers. But this need not subvert the ordinary truths, or truths of the special sciences, which are after all, lest anyone forget, true. To use physics to cast doubt on the motion of baseballs would involve a kind of category mistake. It would be to move from an appreciation of what counts as a baseball's moving, what it takes to be a moving baseball, directly to the nature of truthmakers for the ascription of motion to baseballs.

Something analogous holds for free will. Just as findings in fundamental physics would not jeopardize the motion of baseballs, neither would they jeopardize agency or free will. Not every case you judge to be an instance of agency is an instance of agency, but some are. If you have such a case, you could always ask what it amounts to and hope for eventual enlightenment. If the story you get from physics turns out to be ruthlessly deterministic or includes indeterministic elements, this need not call agency or free will into question. The picture provided by physics, if true, would potentially illuminate the nature of individual instances of agency in the unlikely event that anyone should care, it would not eliminate agency.

It goes without saying that I could easily be wrong about how physics, biology, and psychology are to be squared with one another and with the manifest image that guides our everyday actions and interactions, including

the actions of scientists in their laboratories. I find myself in the position described by John Buridan in a passage quoted at the end of Chapter 2:

> I do not believe that this conclusion is demonstrable, but merely declarable through an induction in which no counter-instance is found . . . . Through such an induction, the intellect, if it does not see a counter-instance or counter-argument, is compelled by its natural inclination to the truth to conclude the universal proposition. (Quoted in Pasnau 2011: 23)

The various sciences do not describe diverse ontological strata, nested levels of being. The manifest and scientific images are not images of distinct realities. No, there is just one reality subject to different, often orthogonal, modes of classification, description, and explanation.

Again, this is not reductionism. There is no prospect of expressing what it would take to be a tree or an agent in the vocabulary of fundamental physics. The manifest image is not derivable from or replaceable by the scientific image. Nor does the position I am recommending accord physics a privileged godlike status. Physics provides an account of the nature of the truthmakers, what I have been calling their natural ontology. Still, although there is but one universe, there are many accounts of what there is, many true accounts.

14.8 Compatibilism?

Readers familiar with debates over agency and free will might chalk this up as nothing more than a ginned up variant of compatibilism. We philosophers are apt to pigeonhole philosophical positions in the course of deciding whether to accept them. One advantage of this practice is that it can spare us the trouble of having to think about the positions. We prefer to look for our car keys where it is easier to look rather than where they are apt to be.

Take compatibilism. Everyone knows compatibilism's pros and cons. Even if you do not, or do not care, most philosophers have settled views on the matter. Some accept, some reject compatibilism, or versions of compatibilism, mostly for reasons that would be for them nonnegotiable. So if I am defending compatibilism, the die is cast, a verdict is at hand, and we can retire to the Dun Cow.

We philosophers, myself included, who are sworn to be open to alternative ways of thinking about any subject matter, are surprisingly unreceptive to the

unfamiliar. We resist being forced outside familiar terrain into uncharted and possibly hostile territory. The result is a kind of wilful blindness to anything that does not align with our comfortable preconceptions. As David Lewis observes, 'any competent philosopher who does not understand something will take care not to understand anything else whereby it might be explained' (Lewis 1986b: 203n).

The risk becomes acute when we turn our attention to the history of philosophy. It is all too easy to read our own views into those of our historical forebears. When that happens, we not only get the history wrong but, more importantly, we forego the chance to learn something that might not otherwise have occurred to us.

If compatibilism is the view that a choice or action can, at once, be both free and determined, I reject the label. Recall the discussion of motion. Truthmakers for 'the baseball moves' could be immobile features of the universe. Is this compatibilism about motion? Compatibilism about motion would be the view that, although the baseball is immobile, it moves. I say that it is true, literally true, true *tout court*, that the baseball moves, false that the baseball is immobile.

In the case of agency, truths about spontaneous actions might not require spontaneous truthmakers. There is no question of harmonizing freedom and determinism. Your choice's being free is not compatible with your choice's being determined, any more than the baseball's moving is compatible with its resting in center field. Were we to discover that your choice had been coerced, manipulated, or produced by factors outside your control, by a device implanted in your brain by Martians, for instance, we would have discovered that you did not, after all, choose freely. We understand well enough what it takes to be an agent, and, if we are honest, we recognize that there is no shortage of agency. To label this compatibilism is to miss the point, a perfectly general point about the relation truths at home in the manifest image bear to truthmakers characterized in the vocabulary of physics.

Moving baseballs, tables, trees, rabbits, and agents choosing freely are all upstanding, tax-paying citizens of the universe revealed in the manifest image. The same universe is encompassed by the scientific image, which provides a closer look at baseballs in motion, the makeup of individual tables, trees, rabbits, and agents choosing freely.

To see physics as a threat to agency is to see the manifest and scientific images as competing accounts of what there is, partially overlapping maps of portions of the universe potentially inconsistent in places. A better analogy

would be an ordinary street map and a high-resolution satellite image of the same terrain: two representations differing, not in what they, at bottom, represent but in how they represent. You can accept the genuineness of agency and responsibility along with the genuineness of baseballs, tables, trees, and rabbits and let the chips fall where they may in physics.

Epilogue

In preparation for landing, the Captain has turned on the 'Fasten Seatbelt' sign. Please return to your seat at this time and ensure that your seat back and tray table are in their full, upright, and locked position. Hand baggage must be stowed in the overhead bins or under the seat in front of you. Larger electronic devices must now be powered off and placed in an overhead bin, or under the seat in front of you. Smaller hand held devices may continue to be used until we arrive at the gate. We will be on the ground shortly.

The Point of It All

The time has come to bring down the curtain on this affair. If you have stayed the course, I hope that, at the very least, I have succeeded in convincing you that there is something to the idea that the manifest image and the scientific image are not in competition, nor are they images of distinct realities, one more fundamental than the other. The scientific image, roughly what you have in physics, undertakes to provide an exacting account of what the manifest is an image of, the nature of the truthmakers for truths issuing from the manifest image, their natural ontology.

Physics is not the only word, however, not even the last word. Physics by its very nature abstracts from its subject matter, and in particular from that subject matter's qualitative nature. The silence of physics on the qualitative character of the universe in no respect amounts to a denial that whatever there is has a qualitative character. Whatever is, is qualitatively imbued. If the universe comprises interacting objects, these do, or would do, whatever they do owing to their qualities. Philosophers' proclivity to cordon off qualities has been a contributing factor in ongoing struggles to comprehend the standing of conscious, intelligent agents in the universe.

Perhaps I have also managed to convince sceptics that metaphysics, and in particular ontology, is not an utter waste of time, not a frivolous pursuit

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reserved for mystics or cloistered academics with too much time on their hands. On the contrary, metaphysics is unavoidable once you step back and ask how things hang together, how the various sciences are related to one another and to everyday experience. Metaphysics is not optional. Under the circumstances, the best course would seem to be take up the subject self-reflectively, or, if that is asking too much, to encourage others so inclined to do so.

I have taken sides on a host of controversial metaphysical issues for two reasons. First, because prevailing attitudes toward these issues are all too often shaped, less by ontologically serious reasoning than by fashion. When you accept what others accept, you are saved from the kind of chronic uneasiness attending anyone who swims upstream. Drifting with the current, or better, paddling with the current, is a surer route to a win, or at least a draw, in the professional game. As Socrates observed, however, without uneasiness, philosophy dies.

Second, I have defended the positions I have because I believe there is something to them. The success of the project does not depend on my being right in the metaphysical details, however, but on my having convinced you that the appearances do not stand between us and reality, or between us and some 'more fundamental' reality. In endeavoring to describe reality, we are endeavoring to say what the appearances are appearances of: appearances *in* reality.

This is the lesson to be learned from, among others, Plato, Aristotle, Ockham, Aquinas, Descartes, Locke, Spinoza, Berkeley, Leibniz, Hume, and Kant. The lesson has been appreciated by many others, including Donald Davidson, D. C. Williams, David Lewis, Keith Campbell, and C. B. Martin. These lists are meant to be broadly illustrative, not exhaustive. To see these philosophers as at odds and leave it at that is to miss the point.

Appearance and Reality

Before retiring from the field, I must honor a promise made in Chapter 1 and say something about F. H. Bradley's approach in *Appearance and Reality* (1893) to the question at hand: what relation do the appearances bear to reality? Having hitched my wagon to Bradley's star by way of my title, I owe him as much.

Although I cannot speak with authority on Bradley, I suspect that his cosmology is closer than you might think to the kind of Spinoza–Williams–Lewis cosmology that, in Chapters 12 and 13, I painted in a distinctly favorable light. (Candlish 2007, and Candlish and Basile 2017 provide much more detailed and reliable discussions of Bradley.)

For Bradley, the appearances are much as I have depicted them in characterizing the manifest image: the universe, as we encounter it in everyday life and in scientists' laboratories, is a noisy, colorful, turbulent, interactive, pluralistic affair. Bradley's contention is that, looked at more closely, the appearances prove to be self-undermining. The reasons for this are complicated, but Bradley's idea, like mine, is that reality must comprise substances. Because it is of the nature of a substance to be self-standing, however, Bradley thinks that there could be at most one substance. Were there others, they would bear relations to one another, and there are, Bradley thought, excellent reasons to exclude relations as a category of being.

What answers to descriptions tailored to the manifest image would be modes of the one substance, not substances or complexes made up of substances. In contrast to the appearances, reality, what Bradley called the Absolute, is 'one system [the contents of which] are nothing but sentient experience. It will hence be a single and all-inclusive experience, which embraces every partial diversity in concord' (Bradley 1893: 129). This reality, Bradley thinks, must be of the same nature as our unfiltered conscious experiences. Anything else would be literally inconceivable. Reality, the truthmaker for judgments concerning the diversities we encounter in experience, includes no relations among distinct existences.

This takes you to a robust idealism apparently at odds with the kind of picture I have been painting. But is it? I have accepted that the mental–material distinction is not a real distinction, but a distinction of reasoned reason, a distinction in conception only. Experiential states are not something estranged from material states. You, an experiencing agent, are made up of whatever makes up everything else.

Were that so, and were occupants of the manifest image, the appearances, to turn out to be modes as Spinoza (and Descartes) would have it, you would have something close to Bradley. So, although he would probably not be comfortable with talk of truthmakers, it might not be much of a stretch to see truths at home in Bradley's manifest image, truths concerning the appearances as being made true by the Absolute: appearance *in* reality.

Go Well

I can say without embarrassment that much of what I have asserted in these pages is likely misleading, false, or worse (the Afterword Paradox). Even so, it need not follow that nothing has been accomplished. I have tried to say what I have had to say plainly, so, if nothing else, I have made it easier for you the reader to avoid making the same mistakes. When it comes to metaphysics there could be no higher ambition.

References

Anscombe, G. E. M. 1959 *An Introduction to Wittgenstein's Tractatus*. London: Hutchinson.

Armstrong, D. M. 1968 *A Materialist Theory of the Mind*. London: Routledge.

Armstrong, D. M. 1989 *Universals: An Opinionated Introduction*. Boulder: Westview Press.

Armstrong, D. M. 1997 *A World of States of Affairs*. Cambridge: Cambridge University Press.

Armstrong, D. M. 2004 'Through the Open Door Again'. In J. Collins, N. Hall, and L. A. Paul, eds. *Causation and Counterfactuals*. Cambridge, MA: MIT Press: 445–57.

Barnes, E. 1994 'Explaining Brute Facts'. *PSA: Proceedings of the Biennial Meeting of the Philosophy of Science Association*, Vol. 1 Contributed Papers: 61–8.

Barrie, J. M. 1913 *My Lady Nicotine*. London: Hodder and Stoughton.

Bedeau, M. A. 1997 'Weak Emergence'. *Philosophical Perspectives* 11: 375–98.

Bennett, J. F. 1980 'Spinoza's Vacuum Argument'. *Midwest Studies in Philosophy* 5: 391–9.

Bennett, J. F. 2001 *Learning from Six Philosophers*, vol. 1. Oxford: Clarendon Press.

Bennett, J. F. and P. Remnant. 1978 'How Matter Might at First be Made'. *Canadian Journal of Philosophy*, suppl. vol. 4: 1–11.

Boscovich, R. J. 1763/1966 *A Theory of Natural Philosophy*. Trans. J. M. Child. Cambridge, MA: M. I. T Press.

Bradley, F. H. 1893 *Appearance and Reality*. London: Swan Sonnenschein. Corrected edition 1930, Oxford: Clarendon Press.

Brower, J. 2010 'Aristotelian Endurantism: A New Solution to the Problem of Temporary Intrinsics'. *Mind* 119: 883–905.

Brower, J. and M. C. Rea. 2005 'Material Constitution and the Trinity'. *Faith and Philosophy* 22: 57–76.

Butler, J. 1729 *Fifteen Sermons Preached at the Rolls Chapel*, 2d ed. London: J. and J. Knapton.

Byron, G. G. 1819 *Don Juan*. ed. L. A. Marchand. Boston: Houghton Mifflin Co., 1958.

Cameron, R. P. 2010 'Necessity and Triviality'. *Australasian Journal of Philosophy* 88: 401–15.

Campbell, D. T. 1974 '"Downward Causation" in Hierarchically Organized Biological Systems'. In F. J. Ayala and T. Dobzhansky, eds. *Studies in the Philosophy of Biology*. London: Macmillan Press: 179–86.

Campbell, K. 1976 *Metaphysics: An Introduction*. Encino: Dickenson Publishing Co.

Campbell, K. 1990 *Abstract Particulars*. Oxford: Basil Blackwell.

Candlish, S. and P. Basile. 2017 'Frances Herbert Bradley'. *Stanford Encyclopedia of Philosophy*. ed. E. N. Zalta. URL = <https://plato.stanford.edu/archives/spr2017/entries/bradley/>.

Candlish, S. 2007 *The Russell/Bradley Dispute and Its Significance for Twentieth Century Philosophy*. New York: Palgrave Macmillan.

Cartwright, N. 1983 *How the Laws of Physics Lie*. Oxford: Clarendon Press.

Chakravartty, A. 2017 *Scientific Ontology: Integrating Naturalized Metaphysics and Voluntarist Epistemology*. New York: Oxford University Press.

Chalmers, D. J. 1996 *The Conscious Mind: In Search of a Fundamental Theory*. New York: Oxford University Press.

Chalmers, D. J. 2006 'Strong and Weak Emergence'. In P. Clayton and P. Davies, eds. *The Re-Emergence of Emergence: The Emergentist Hypothesis from Science to Religion*. Oxford: Oxford University Press: 244–54.

Charles, D. 2008 'Aristotle's Psychological Theory'. *Proceedings of the Boston Area Colloquium in Ancient Philosophy* 24: 1–29.

Cohen, S. M. 2015 'Aristotle's Metaphysics'. In E. N. Zalta, ed. *The Stanford Encyclopedia of Philosophy*. URL = <http://plato.stanford.edu/archives/sum2016/entries/aristotle-metaphysics/>.

Della Rocca, M. 2003 'A Rationalist Manifesto: Spinoza and the Principle of Sufficient Reason'. *Philosophical Topics* 31: 75–93.

Della Rocca, M. 2010 'PSR'. *Philosophers' Imprint* 10: 1–13.

Descartes, R. 1641 *Meditations on First Philosophy*. Trans. J. Cottingham. Cambridge: Cambridge University Press, 1968.

Descartes, R. 1644 *Principles of Philosophy*. In J. Cottingham, R. Stoothoff, and D. Murdoch, trans. *The Philosophical Writings of Descartes*. Vol. 1. Cambridge: Cambridge University Press: 177–291.

Dipert, R. R. 1997 'The Mathematical Structure of the World: The World as Graph'. *Journal of Philosophy* 94: 329–58.

Eddington, A. S. 1928 *The Nature of the Physical World*. New York: The Macmillan Co.

Esfeld, M. 2016 'The Reality of Relations: The Case from Quantum Physics'. In Marmodoro and Yates, 2016: 218–34.

Esfeld, M. 2020 *Science and Human Freedom*. London: Palgrave-Macmillan.

Evnine, S. J. 2016 *Making Objects and Events: A Hylomorphic Theory of Artifacts, Actions, and Organisms*. Oxford: Oxford University Press.

Fahrbach, L. 2005 'Understanding Brute Facts'. *Synthese* 145: 449–66.

Field, H. 2003 'Causation in a Physical World'. In M. Loux and D. Zimmerman, eds. *Oxford Handbook of Metaphysics*. Oxford: Oxford University Press: 435–60.

Fine, K. 1994 'Essence and Modality'. In J. E. Tomberlin, ed. *Logic and Language* (*Philosophical Perspectives* vol. 8). Atascadero, CA: Ridgeview Press: 1–16.

Fine, K. 1995 'The Problem of Mixture'. *Pacific Philosophical Quarterly* 76: 266–369.

Fine, K. 1999 'Things and their Parts'. *Midwest Studies in Philosophy* 23: 61–74.

Fine, K. 2008 'Coincidence and Form'. *Proceedings of the Aristotelian Society, Supp*. 82: 101–18.

Fine, K. 2010 'Towards a Theory of Part'. *Journal of Philosophy* 103: 652–98.

Fisher, A. R. J. 2015 'David Lewis, Donald C. Williams, and the History of Metaphysics in the Twentieth Century'. *Journal of the American Philosophical Association* 1: 3–22.

Fisher, A. R. J. 2017 'Donald C. Williams's Defense of Real Metaphysics'. *British Journal for the History of Philosophy* 25: 332–55.

Fodor, J. A. 1974 'Special Sciences (Or: The Disunity of Science as a Working Hypothesis)'. *Synthese* 28: 97–115.

Fodor, J. A. 1997 'Special Sciences: Still Autonomous after All These Years'. *Philosophical Perspectives* 11: 149–63. Reprinted in *In Critical Condition: Polemical Essays on Cognitive Science and the Philosophy of Mind*. Cambridge, MA: MIT Press: 9–24.

Friedman, M. 1974. 'Explanation and Scientific Understanding'. *Journal of Philosophy* 71: 5–19.

Furth, M. 1978 'Transtemporal Stability in Aristotelian Substances'. *Journal of Philosophy* 75: 624–46.

Furth, M. 1988 *Substance, Form, and Psyche: An Aristotelean Metaphysics*. Cambridge: Cambridge University Press.

Garber, D. 1992 *Descartes' Metaphysical Physics*. Chicago: University of Chicago Press.

Garcia, R. K. 2015 'Two Ways to Particularize a Property'. *Journal of the American Philosophical Association* 1: 635–52.

Garrett, D. 2017 'The Indiscernibility of Identicals and the Transitivity of Identity in Spinoza's Logic of the Attributes'. In Y. Melamed, ed. *The Cambridge Guide to Spinoza's Ethics*. Cambridge: Cambridge University Press: 12–42. Reprinted in *Nature and Necessity in Spinoza's Philosophy*. New York: Oxford University Press: 263–92.

Gill, M. L. 2005 'Aristotle's *Metaphysics* Reconsidered'. *Journal of the History of Philosophy* 43: 223–51.

Goff, P. 2017 *Consciousness and Fundamental Reality*. Oxford: Oxford University Press.

Goff, P., W. Seager, and S. Allen-Hermanson. 2017 'Panpsychism'. In E. N. Zalta, ed. *The Stanford Encyclopedia of Philosophy*. URL = <https://plato.stanford.edu/archives/win2017/entries/panpsychism/>.

Goodman, N. 1955 *Fact, Fiction, and Forecast*. Cambridge, MA: Harvard University Press.

Grant, E. 1981 *Much Ado About Nothing: Theories of Space and Vacuum from the Middle Ages to the Scientific Revolution*. Cambridge: Cambridge University Press.

Hawking, S. 1988 *A Brief History of Time*. New York: Bantam Books.

Heil, J. 1992 *The Nature of True Minds*. Cambridge: Cambridge University Press.

Heil, J. 2003 *From an Ontological Point of View*. Oxford: Clarendon Press.

Heil, J. 2009 'Relations'. In R. Le Poidevin and R Cameron, eds. *Routledge Companion to Metaphysics*. London: Routledge: 310–21.

Heil, J. 2012 *The Universe as We Find It*. Oxford: Clarendon Press.

Heil, J. 2013 'Contingency'. In T. Goldschmidt, ed. *The Puzzle of Existence: Why Is There Something Rather Than Nothing?* London: Routledge: 167–81.

Heil, J. 2015a 'Aristotelian Supervenience'. *Proceedings of the Aristotelian Society* 115: 41–56.

Heil, J. 2015b 'Cartesian Transubstantiation'. In J. Kvanvig, ed. *Oxford Studies in the Philosophy of Religion*, vol. 6. Oxford: Oxford University Press: 139–57.

Heil, J. 2016 'Causal Relations'. In A. Marmodoro and D. Yates, eds. *The Metaphysics of Relations*. Oxford: Oxford University Press: 127–37.

Heil, J. 2017a 'Downward Causation'. In M. P. Paoletti and F. Orilia, eds. *Philosophical and Scientific Perspectives on Downward Causation*. London: Routledge: 42–53.

Heil, J. 2017b 'Real Agency'. *Harvard Review of Philosophy* 24: 9–22.

Heil, J. 2018a 'Must there Be Brute Facts?' In E. Vintiadis and C. Mekios, eds. *Brute Facts*. Oxford: Oxford University Press: 19–27.

Heil, J. 2018b 'Objects, Ordinary and Otherwise'. In J. Cumpa and B. Brewer, eds. *The Nature of Ordinary Objects*. Cambridge: Cambridge University Press: 75–93.

Heil, J. 2018c 'The Mystery of the Mystery of Consciousness'. In M. P. Guta, ed. *Consciousness and the Ontology of Properties*. London: Routledge: 15–23.

Heil, J. 2019 'Ontology of Powers'. In A. S. Meincke ed. *The Ontological Commitments of Dispositionalism*. Berlin: Springer: 18–29.

Heil, J. Forthcoming-a 'Hylomorphism: What's Not to Like?' *Synthese*.

Heil, J. Forthcoming-b 'Category Mistakes'. In J. Cumpa, ed. *Categorical Ontologies*. London: Routledge.

Heil, J. Forthcoming-c 'Modal Angst'. In H. Beebee and A. J. R. Fisher, eds. Forthcoming. *David Lewis: A Historical Perspective*. Oxford: Oxford University Press.

Hendry, R. F. 2006 'Elements, Compounds, and Other Chemical Kinds'. *Philosophy of Science* 73: 864–75.

Huemer, M. and B. Kovitz. 2003 'Causation as Simultaneous and Continuous'. *The Philosophical Quarterly* 53: 556–65.

Hume, D. 1779 *Dialogues Concerning Natural Religion*. ed. N. K. Smith. Edinburgh: Thomas Nelson and Sons, 1947.

Ingthorsson, R. D. 2002 'Causal Production as Interaction'. *Metaphysica* 3: 87–119.

Jackson, F. C. 1998 *From Metaphysics to Ethics: A Defense of Conceptual Analysis*. Oxford: Clarendon Press.

Jaworski, W. 2016 *Structure and the Metaphysics of Mind: How Hylomorphism Solves the Mind–Body Problem*. Oxford: Oxford University Press.

Johnston, M. 2006 'Hylomorphism'. *Journal of Philosophy* 103: 652–98.

Kant, I. (1787/1929) *Critique of Pure Reason*. Trans. N. K. Smith. London: Macmillan & Co.

Kim, J. 1990 'Supervenience as a Philosophical Concept'. *Metaphilosophy* 12: 1–27; reprinted in *Supervenience and Mind: Selected Philosophical Essays*. Cambridge: Cambridge University Press, 1993: 131–60.

Kim, J. 2000 'Making Sense of Downward Causation'. In P. B. Andersen, C. Emmeche, N. O. Finnemann, and P. V. Christiansen, eds. *Downward Causation: Minds, Bodies, and Matter*. Aarhaus: Aarhaus University Press: 305–21.

King, P. 2007 'Why Isn't the Mind–Body Problem Medieval?' In H. Lagerlund, ed. 2007 *Forming the Mind: Essays on the Internal Senses and the Mind/Body Problem from Avicenna to the Medical Enlightenment*. Berlin: Springer: 187–205.

Kirk, R. 1974 'Zombies versus Materialists'. *Aristotelian Society Proceedings* (suppl.) 48: 135–52.

Kirk, R. 2005 *Zombies and Consciousness*. Oxford: Clarendon Press.

Koons, R. 2014 'Staunch vs. Faint-Hearted Hylomorphism: Toward an Aristotelian Account of Composition'. *Res Philosophica* 91: 151–77.

Koslicki, K. 2008 *The Structure of Objects*. Oxford: Oxford University Press.

Koslicki, K. 2012 'Essence, Necessity, and Explanation'. In T. E. Tahko, ed. *Contemporary Aristotelian Metaphysics*. Cambridge: Cambridge University Press: 187–206.

Krauss, L. M. 2012 *A Universe from Nothing: Why there Is Something Rather than Nothing*. New York: Free Press.

Kripke, S. 1971 'Identity and Necessity'. In M. K. Munitz, ed. *Identity and Individuation*. New York: New York University Press: 135–64.

Ladyman, J. and D. Ross, with D. Spurrett and J. Collier. 2007 *Every Thing Must Go: Metaphysics Naturalized*. Oxford: Oxford University Press.

Lange, M. 2009 *Laws and Lawmakers: Science, Metaphysics, and the Laws of Nature*. Oxford: Oxford University Press.

Leibniz, G. W. 1715/1973 'Leibniz–Clarke Correspondence'. Trans. M. Morris and G. H. R. Parkinson. In *Leibniz: Philosophical Writings*. ed. G. H. R. Parkinson. London: J. M. Dent & Sons.

Lennon, T. M. 2007 'The Eleatic Descartes'. *Journal of the History of Philosophy* 45: 29–47.

Levine, J. 1983 'Materialism and Qualia: The Explanatory Gap'. *Pacific Philosophical Quarterly* 64: 354–61. Reprinted in Heil, J., ed. *Philosophy of Mind: A Guide and Anthology* (Oxford: Oxford University Press): 772–80.

Levinson, J. 1978 'Properties and Related Entities'. *Philosophy and Phenomenological Research* 39: 1–22.

Levinson, J. 2006 'Why There Are No Tropes'. *Philosophy* 81: 563–79.

Lewis, D. K. 1973 *Counterfactuals*. Cambridge, MA: Harvard University Press.

Lewis, D. K. 1986a *Philosophical Papers*, vol. 2. New York: Oxford University Press.
Lewis, D. K. 1986b *On the Plurality of Worlds*. Oxford: Basil Blackwell.
Lewis, D. K. 1994 'Humean Supervenience Debugged'. *Mind* 103: 473–90.
Locke, J. 1690 *An Essay Concerning Human Understanding*. ed. P. H. Nidditch, Oxford: Clarendon Press, 1978.
Lockwood, M. 1989 *Mind, Brain and Quantum*. Oxford: Basil Blackwell.
Loux, M. J. 2002 *Metaphysics: A Contemporary Introduction*. London: Routledge.
Lowe, E. J. 1998 'Form without Matter'. *Ratio* 11: 214–34.
Lowe, E. J. 2006 *The Four-Category Ontology: A Metaphysical Foundation for Natural Science*. Oxford: Clarendon Press.
Lowe, E. J. 2008a 'Essentialism, Metaphysical Realism, and the Errors of Conceptualism'. *Philosophia Scientiæ* 12: 9–33.
Lowe, E. J. 2010 'On the Individuation of Powers'. In A Marmodoro, ed. *The Metaphysics of Powers: Their Grounding and their Manifestations*. London & New York: Routledge: 8–26.
Lowe, E. J. 2011 'How Not to Think of Powers: A Deconstruction of the "Dispositions and Conditionals" Debate'. *The Monist* 94: 19–33.
Lowe, E. J. 2012 'Essence and Ontology'. In D. Novak, D. D. Novotny, P. Sousedik, and D. Svoboda, eds. *Metaphysics: Aristotelian, Scholastic, Analytic*. Frankfurt: Ontos Verlag: 93–111.
Lowe, E. J. 2018 'Metaphysics as the Science of Essence'. In A. D. Carruth, S. C. Gibb, J. Heil, eds. *Ontology, Modality, and Mind: Themes from the Metaphysics of E. J. Lowe*. Oxford: Oxford University Press: 14–34.
Maier, A. 1982 *On the Threshold of Exact Science: Selected Writings of Anneliese Maier on Late Medieval Natural Philosophy*. ed. and trans. S. D. Sargent. Philadelphia: University of Pennsylvania Press.
Marenbon, J. 2009 'The Medievals'. In H. Beebee, C. Hitchcock, and P. Menzies, eds. *The Oxford Handbook of Causation*. Oxford: Oxford University Press: 4–54.
Marmodoro, A. 2013 'Aristotelian Hylomorphism without Reconditioning'. *Philosophical Inquiry* 36: 5–22.
Martin, C. B. 1987 'Proto-Language'. *Australasian Journal of Philosophy* 65: 277–89.
Martin, C. B. 1993 'Power for Realists'. In J. Bacon, K. Campbell, and L. Reinhardt, eds. *Ontology, Causality, and Mind: Essays in Honour of D. M. Armstrong*. Cambridge: Cambridge University Press: 175–86.
Martin, C. B. 1994 'Dispositions and Conditionals'. *Philosophical Quarterly* 44: 1–8.
Martin, C. B. 1997 'On the Need for Properties: The Road to Pythagoreanism and Back'. *Synthese* 112: 193–231.
Maudlin, T. 1998 'Part and Whole in Quantum Mechanics'. In E. Castellani, ed. *Interpreting Bodies: Classical and Quantum Objects in Modern Physics*. Princeton: Princeton University Press: 46–60.
Maudlin, T. 2007 *The Metaphysics within Physics*. Oxford: Oxford University Press.
Martin, C. B. 2008 *The Mind in Nature*. Oxford: Clarendon Press.
Matson, W. I. 1966 'Why Isn't the Mind–Body Problem Ancient?' In P. K. Feyerabend. and G. Maxwell, eds. *Mind, Matter, and Method: Essays in Philosophy and Science in Honor of Herbert Feigl*. Minneapolis: University of Minnesota Press: 92–102.
McLaughlin, B. P. 1992 'The Rise and Fall of British Emergentism'. In A. Beckermann, H. Flohr, and J. Kim, eds. 1992 *Emergence or Reduction? Essays on the Prospects of Nonreductive Physicalism*. Berlin: Walter de Gruyter: 49–93.
Melamed, Y. 2013 *Spinoza's Metaphysics: Substance and Thought*. Oxford: Oxford University Press.

Melamed, Y. and M. Lin. 2015 'Principle of Sufficient Reason'. In E. N. Zalta, ed. *The Stanford Encyclopedia of Philosophy* URL = <http://plato.stanford.edu/archives/spr2015/entries/sufficient-reason/>.

Mele, A. R. 2011 'Free Will and Science'. In R. H. Kane, ed. *The Oxford Handbook of Free Will*, 2d ed. Oxford: Oxford University Press: 499–514.

Miller, E. 2014 'Quantum Entanglement, Bohmian Mechanics, and Humean Supervenience. *Australasian Journal of Philosophy* 92: 567–83.

Miller, E. 2020 'Two Notions of Holism'. Synthese 197: 4187–206.

Milton, J. R. 1998 'Laws of Nature'. In D. Garber and M. Ayres, eds. *The Cambridge History of Seventeenth-Century Philosophy*. Cambridge: Cambridge University Press: 680–701.

Montalenti, G. 1974 'From Aristotle to Democritus via Darwin'. In F. J. Ayala and T. Dobzhansky, eds. *Studies in the Philosophy of Biology*. London: Macmillan Press: 3–19.

Moore, G. E. 1919 'External and Internal Relations'. *Proceedings of the Aristotelian Society* 20: 40–62.

Moore, G. E. 1939 'Proof of an External World' *Proceedings of the British Academy* 25: 273–300.

Morris, K. 2018 *Physicalism Deconstructed: Levels of Reality and the Mind–Body Problem*. Cambridge: Cambridge University Press.

Mumford, S. D. and R. L. Anjum. 2011 *Getting Causes from Powers*. Oxford: Oxford University Press.

Nagel, T. 1986 *The View from Nowhere*. Oxford: Oxford University Press.

Nerlich, G. 2013 *Einstein's Genie: Spacetime Out of the Bottle*. Montreal: Minkowski Institute Press.

Ney, A. 2009 'Physical Causation and Difference-Making'. *British Journal for the Philosophy of Science* 60: 737–64.

Norton, J. 2003 'Causation as Folk Science'. *Philosophers' Imprint* 3. <http://www.philosophersimprint.org/003004/>.

Oderberg, D. 2007 *Real Essentialism*. London and New York: Routledge.

Pasnau, R. 2011 *Metaphysical Themes 1274–1671*. Oxford: Clarendon Press.

Pereboom, D. 2002 'Living without Free Will: The Case for Hard Incompatibilism'. In R. H. Kane, ed. *The Oxford Handbook of Free Will*. Oxford: Oxford University Press: 477–88.

Place, U. T. 1956 'Is Consciousness a Brain Process?' *British Journal of Psychology* 47: 44–50.

Plato. *Sophist*. In *Plato: Theaetetus and Sophist* (*Cambridge Texts in the History of Philosophy*). ed. and trans. C. Rowe. Cambridge: Cambridge University Press, 2015.

Pruss, A. R. 2006 *The Principle of Sufficient Reason: A Reassessment*. Cambridge: Cambridge University Press.

Rayo, A. 2010 'Towards a Trivialist Account of Mathematics'. In O. Bueno and O. Linnebo, eds. 2010 *New Waves in Philosophy of Mathematics*. Basingstoke: Palgrave Macmillan: 239–62.

Rea, M. C. 2011 'Hylomorphism Reconditioned'. *Philosophical Perspectives* 25: 341–58.

Rovelli, C. 2015 'Aristotle's Physics: A Physicist's Look'. *Journal of the American Philosophical Association* 1: 23–40.

Rovelli, C. 2016 *Seven Brief Lessons on Physics*. Trans. S. Carnell and E. Segre. New York: Riverhead Books.

Russell, B. 1903 'Asymmetrical Relations'. In *The Principles of Mathematics*. London: Routledge: 218–26.

Russell, B. 1912 'On the Notion of a Cause'. *Proceedings of the Aristotelian Society* (New Series) 13: 1–26. Reprinted in *Mysticism and Logic*. London: Longmans, Green and Co., 1918: 180–208.

Ryle, G. 1949 *The Concept of Mind*. London: Hutchinson and Co.

Schaffer, J. 2010 'Monism: The Priority of the Whole'. *Philosophical Review* 119: 31–76.

Seargent, D. A. J. 1985 *Plurality and Continuity*: *An Essay in G. F. Stout's Theory of Universals*. The Hague: Martinus Nijhoff.

Sellars, W. 1962 'Philosophy and the Scientific Image of Man'. In R. Colodny, ed. *Frontiers of Science and Philosophy*. Pittsburgh: University of Pittsburgh Press: 35–78. Reprinted in Sellars, 1963: 1–40.

Sellers, W. 1963 *Science, Perception, and Reality*. London: Routledge and Kegan Paul.

Shein, N. 2018 'Spinoza's Theory of Arrtibutes'. In E. N. Zalta, ed. *The Stanford Encyclopedia of Philosophy*. URL = <https://plato.stanford.edu/archives/spr2018/entries/spinoza-attributes/>.

Shein, N. 2019 '"Certainly the Maker of All Things Will Not Be *Never* or *Nowhere*": Newton *contra* Descartes in the *General Scholium*'. In S. Snobelen, S. Mandelbrote, and S. Ducheyne, eds. *Isaac Newton's General Scholium to the Principia: Science, Religion, and Metaphysics*. TBD: 000–0.

Shields, C. 2015 'Aristotle'. In E. N. Zalta, ed. *The Stanford Encyclopedia of Philosophy*. URL = <http://plato.stanford.edu/archives/fall2015/entries/aristotle/>.

Shoemaker, S. 1980 'Causality and Properties'. In P. van Inwagen, ed., *Time and Cause*. Dordrecht: Reidel Publishing Co.: 109–35. Reprinted in *Identity, Cause, and Mind: Philosophical Essays*. Cambridge: Cambridge University Press, 1984: 206–33.

Simons, P. 2005 'Digging Deeper' <https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbnxwZXRlcm1zaW1vbnN8Z3g6NWU4ZmY2YzQyZjE2ZTIxNQ>.

Smart, J. J. C. 1959 'Sensations and Brain Processes'. *Philosophical Review* 68: 141–56.

Smilansky, S. 2002 'Free Will, Fundamental Dualism, and the Centrality of Illusion'. In R. H. Kane, ed. *The Oxford Handbook of Free Will*. Oxford: Oxford University Press: 489–505.

Sorensen, R. 1985 'An Argument for the Vagueness of "Vague"'. *Analysis* 45: 134–7.

Sperry, R. W. 1969 'A Modified Concept of Consciousness'. *Psychological Review* 76: 532–6.

Strawson, G. 2002 'The Bounds of Freedom'. In R. H. Kane, ed. *The Oxford Handbook of Free Will*. Oxford: Oxford University Press: 441–60.

Strawson, G. 2008 *Real Materialism and Other Essays*. Oxford: Clarendon Press.

Strawson, G. 2015 'Humeanism'. *Journal of the American Philosophical Association* 1: 96–102.

Suárez, F. 1597/1947 'On the Various Kinds of Distinction'. *Disputationes Metaphysicae, Disputatio* VII. Trans, C. Vollert. Milwaukee: Marquette University Press.

Teller, P. 1989 'Relativity, Relational Holism, and the Bell Inequalities'. In Cushing and McMullin, 1989: 208–23.

Thomasson, A. L. 2007 *Ordinary Objects*. Oxford: Oxford University Press.

Thomasson, A. L. 2016. 'Categories'. In E. N. Zalta, ed. *The Stanford Encyclopedia of Philosophy*. URL = <https://plato.stanford.edu/archives/win2016/entries/categories/>.

Tolstoy, L. 1903/1906 'Three Questions'. In *Twenty-Three Tales*. Trans. L. Maud and A. Maud. London: Oxford University Press: 294–8.

Trivers, R. 2011 *The Folly of Fools: The Logic of Deceit and Self-Deception in Human Life*. New York: Basic Books.

van Inwagen, P. 1983 *An Essay on Free Will*. Oxford: Clarendon Press.
van Inwagen, P. 1990 *Material Beings*. Ithaca, NY: Cornell University Press.
van Inwagen, P. 1993 'Précis of *Material Beings*'. *Philosophy and Phenomenological Research* 53: 683–6.
van Inwagen, P. 2007 'A Set of Accidents'. *Times Literary Supplement* 21 and 28 December: 38.
van Inwagen, P. 2015 'Some Thoughts on *An Essay on Free Will*'. *The Harvard Review of Philosophy* 22: 16–30.
Whitehead, A. N. 1929 *Process and Reality: An Essay in Cosmology*. Cambridge: Cambridge University Press.
Williams, D. C. 1944 'Naturalism and the Nature of Things'. *Philosophical Review* 52: 417–43. Reprinted in Williams, 1966: 212–38.
Williams, D. C. 1953 'On the Elements of Being'. *Review of Metaphysics* 7: 3–18; 171–92. Reprinted as 'The Elements of Being' in Williams, 1966: 74–109; and in A. J. R. Fisher, ed. *The Elements and Patterns of Being*. Oxford: Oxford University Press, 2018: 24–50.
Williams, D. C. 1954 'Of Essence and Existence in Santayana'. *Journal of Philosophy* 51: 31–42.
Williams, D. C. 1959a 'Universals and Existents'. A paper delivered to the Yale Philosophy Club and published posthumously in *The Australasian Journal of Philosophy* 64 1986: 1–14; and reprinted in in A. J. R. Fisher, ed. *The Elements and Patterns of Being*. Oxford: Oxford University Press 2018: 51–66.
Williams, D. C. 1959b 'Mind A Matter of Fact'. *Review of Metaphysics* 13: 203–25. Reprinted in *Principles of Empirical Realism*. Springfield: Charles C. Thomas, 1966: 239–61.
Williams, D. C. 1963 'Necessary Facts'. *Review of Metaphysics* 16: 601–26.
Williams, D. C. 1966 *Principles of Empirical Realism*. Springfield: Charles C. Thomas.
Williamson, J. 2009 'Probabilistic Theories'. In H. Beebee, C. Hitchcock, and P. Menzies, eds. *The Oxford Handbook of Causation*. Oxford: Oxford University Press: 185–212.
Wittgenstein, L. (1953/1968). *Philosophical Investigations*. Trans. G. E. M. Anscombe, Oxford: Basil Blackwell.

Name Index

For the benefit of digital users, indexed terms that span two pages (e.g., 52–53) may, on occasion, appear on only one of those pages.

Anjum, R. L. 127–8
Anscombe, G. E. M. 171
Aquinas 125, 154, 221–2, 226, 237
Aristotle 12–17, 19, 24, 29, 40, 56, 64, 68–9, 77, 96, 130–2, 148–61, 178, 187, 200, 237; *see also*, metaphysics, Aristotelian
Armstrong, D. M. 41, 72, 93, 106, 114–15, 119, 126, 164, 193–4

Barnes, E. 180–1
Barrie, J. M. 179
Bedau, M. 135–7
Berkeley, G. 75–6, 237
Boscovich, R. 83, 205–6
Bradley, F. H. 10, 16, 237–8
Brower, J. 149–50, 156
Buridan, J. 36, 232–3
Butler, J. 52, 63
Byron, G. G. 2

Campbell, D. T. 133, 137–8
Campbell, K. 21, 26, 40, 60, 69, 83, 117–18, 120, 142–5, 191, 194, 199–202, 205–6, 237
Candlish 237–8
Cartwright, N. 114–15
Chakravartty, A. 35, 84
Chalmers, D. C. 96, 103, 137
Charles, D. 154, 158

Davidson 237
Descartes, R. 14, 29–31, 40, 55–7, 59, 96, 99, 102, 125, 141, 158, 198–99, 209, 237, 238
Dipert, R. 84

Eddington, A. S. 5–6, 9–10, 38–9, 215–16
Esfeld, M. 134, 203–5, 207
Evnine, S. 19, 63–4, 149–50, 156

Fine, K. 61, 149–50, 156, 163
Fisher, A. R. J. 165–6

Galileo Galilei 99
Goff, P. 144–5
Goodman, N. 168

Hawking, S. 183–4
Hendry, R. 65
Hume, D. 12, 16, 56, 111–12, 125–6, 165–6, 168–9, 172, 187, 193, 210–11, 237; *see also*, metaphysics, Humean

Jackson, F. C. 88–90, 164
Jaworski, W. 63–4, 149–50, 156
Johnston, M. 63–4, 149–50, 156

Kant, I. 120–1, 218, 237
Kim, J. 98, 142
Koons, R. 63–4, 149–50, 156
Koslicki, K. 61, 63–4, 149–50
Kripke, S. A. 64–5

Ladyman, J. 35, 84
Lange, M. 126
Leibniz, G. W. 21, 47, 53, 118, 224, 237
Lewis, D. K. 16, 72, 100, 112, 162–72, 174–8, 192–9, 201–4, 207–11, 213–15, 219–20, 232–4, 237–8
Lin, M. 184, 187
Locke, J. 14, 59, 64–5, 76, 99–100, 141, 155–6, 209, 237
Lockwood, M. 144–5
Lowe, E.J. 14, 40–1, 63–9, 86, 155–6, 163

Mark 217, 225
Marmodoro, A. 63–4, 149–50, 154, 156
Martin, C. B. 10, 18, 38–9, 81, 85, 87, 102–3, 115, 123, 237

Melamed, Y. 29–30, 198–9
Mele, A. R. 221
Miller, E. 203, 210–11
Montalenti, G. 130
Mumford, S. D. 127–8
Musial, S. 50

Nerlich, G. 62, 194, 199
Newton, I. 57, 59, 125–6, 141, 180, 203

Ockham, W. 36, 237

Pereboom, D. 226, 231
Place, U. T. 104
Plato 49, 81–2, 148, 237
Prychitko, E. 25
Pujols, A. 229

Quine, W. V. O. 118

Rea, M. 149–50, 156
Rovelli, C. 13, 35, 222
Russell, B. A. W. 118–19, 189
Ryle, G. 86, 90, 120–1

Schaffer, J. 207–10
Schriefl, A. 154
Sellars, W. 4–5, 9–10, 144–5, 212
Shein, N. 29–30, 125, 199
Shields, C. 151, 154
Shoemaker, S. 84–5
Simons, P. 22
Smart, J. J. C. 72, 104, 106
Sorensen, R. 49
Sperry, R. W. 133, 142
Spinoza, B. 14, 16, 29–31, 34, 59, 141, 158–9, 161, 171, 198–9, 201–5, 207–11, 213–14, 219–20, 232, 237–8
Strawson, G. 112, 137, 143, 226
Suarez, F. 102, 198

Thomasson, A. 19
Tolstoy, L. 78
Trivers, R. 221

van Inwagen, P. 48–9, 150–1, 156–7, 217, 222–3, 226, 230

Whitehead, A. N. 215
Williams, D. C. 1, 16–17, 19, 24–5, 36–7, 40–1, 61, 69, 148, 160, 166–7, 169, 175–7, 189, 191–204, 207–16, 219–20, 232, 237
Wittgenstein, L. 96, 151, 171

Subject Index

For the benefit of digital users, indexed terms that span two pages (e.g., 52–53) may, on occasion, appear on only one of those pages.

absence 114–15, 128–9, 165, 177, 207; *see also*, privation
accident 19–20, 24, 29, 40–1, 77, 148, 153, 159, 161; *see also*, mode
  real 40–1, 208
Afterword Paradox 239
agency 16, 217
  essence of 220–1
  truthmakers for ascriptions of 226–32, 234–5
agent 3–4, 55–7, 77, 218, 220–36
  conscious 88, 94–5, 103, 107, 141, 144, 180, 199, 236, 238
antirealism 52, 89–90
appearances 2–3, 6–7, 101, 146, 209, 217–20
  mere 5, 10, 95, 229
  their relation to reality 2–4, 17, 46, 146, 211–15, 237–8; *see also*, manifest image; scientific image
Aristotelianism, *see* metaphysics, Aristotelian; universe, Aristotelian
artefact 38, 49, 56–7, 150–2, 157, 179
attribute 14, 29–31, 198–200, 213–14

bare particular 25, 80, 153–4, 195
Big Bang 33–4, 146–7, 172–3, 184–6
blancmange universe, *see* universe, blancmange
bridge principle 71

category, ontological 6, 14, 17, 40–2, 63, 66–9, 74, 153, 193–5, 198, 209, 238
  founded 21–9, 35–6, 92, 117–18
  instances of 22–3, 32
  unfounded 25, 28–9, 32
category mistake 65, 104, 156, 232
causal-dispositional profile 72, 100–3, 169
causation 15–16, 27–8, 60, 80, 92, 111, 145–6, 160, 172–3, 187, 189–90, 196, 198–202, 205, 210–11, 213–14
  by absences 128–9
  agent 224
  as bringing about 13, 15, 26–8, 32–3, 60, 72–3, 111–13, 116, 120, 122, 152–3, 157, 172, 175–6, 187, 189, 192, 196, 203–4, 213
  as contingent 127–8, 168, 172, 182, 185, 187
  counterfactual accounts of 20–1, 113, 121, 126
  downward 15–16, 58–9, 130, 148–9, 157–8
  efficient 15, 60, 111, 132, 135, 145–6, 160, 189–90, 196, 198–202, 205, 211, 213
  as an external relation 28, 112, 187
  Humean account of 15, 27–8, 112, 116, 126, 129, 210–11
  instances of 122, 126–7, 145, 189, 199, 203–4
  as an internal relation 15, 117–20, 127
  mental 72–3, 88, 94, 199
  probabilistic 115–16, 124
  as the mutual manifesting of powers 15, 87, 120–3
  as necessary 127, 130, 172
  as necessitation 112–15, 126, 177, 196–7, 201; *see also* necessitation
  top-down, *see* causation, downward
  whole-to-part, *see* causation, downward
change 44–5, 53–4, 66–8, 76, 103, 134–5, 140, 150–2, 154–5, 196–8, 201, 203–4, 212
  accidental 151–2
  substantial 151–2
compatibilism 218, 223–4, 227, 233–5

composition 48–9, 150, 152, 156, 158; *see also* special composition question
consciousness 6, 15, 30–1, 92–3, 111, 133, 142–5, 199, 238
  as emergent 95, 137, 140, 142–3
  Hard Problem of 76, 96, 99–100; *see also*, consciousness, puzzle of
  puzzle of 93–6; *see also*, consciousness, Hard Problem of
  science of 93, 95
constraints imposed by being, *see* constraints imposed by reality
constraints imposed by reality 34, 173–4, 181, 183–7
contingency 34, 122–4, 164–5, 171–5, 177, 180, 182–3, 185, 187–8, 197, 201
cosmology 37–8, 191–3, 196, 198, 209–10, 215, 220, 227, 237–8
  speculative 1, 191–6, 214
  see also, universe
counterfactuals, *see* truthmakers for counterfactuals
counterpart 164–5, 170

definition, real 45, 65–6, 158, 220–1; *see also*, essence
derivability 136–8, 149
determinate and determinable 22
determinism 218, 222–3, 230, 234; *see also*, universe, deterministic
deus sive natura 160
disposition 82, 111, 122–3; *see also* power
  antirealism about 90
  categorical basis of 82, 87–91
  as epiphenomenal 88
  ground of, *see* disposition, categorical basis of
  multi-tracked 86, 120–1
  reciprocal partners 15, 33, 84–7, 102, 120–4, 126–8, 192
  single-tracked 86, 121
dispositional matrix 122–4, 173
dispositional system 102–3, 127, 129, 175–6
dissimilarity 119; *see also* relation, similarity
distinction, kinds of 102
  conceptual 108, 198, 238
  founded 198–200
  modal 102, 198
  real 102, 198–200, 238
  reasoned reason 108, 198–200, 238
  reasoning reason 198
dualism, mental–physical 3–4, 95–6, 98–9, 144

emergence 8, 15, 58–9, 95, 130, 148–9, 157
  real 146–7
  strong 136–7
  weak 135–6
entailment 22, 93, 114–15, 126, 208
entity, emergent 134–7; *see also* property, emergent; state, emergent; substance, emergent
essence 14, 19, 29–33, 45, 61, 111, 148, 152–3, 155–6, 163; *see also*, form, substantial
  as a kind of entity 14, 19, 45, 63–5, 76, 155–8, 199, 220–1, 226
  Episcopalian 75–6
  individual 63
  instances of 44–5, 52, 70, 75
  general 67–8
  Lowe on 63–8, 155–6
  metaphysics as the science of 77, 163
  precedes existence 67, 69, 77
  real 64–5, 155–6
Evil Demon 229–30
Evil Genius 52
ex nihilo nihil fit 36, 151, 186
experience 1, 3
  conscious 1, 3, 15, 78, 92, 94–5, 97, 99–110, 142–5, 216, 238
  everyday, *see* experience, ordinary
  of an experience 107–10
  ordinary 3, 10, 13, 37–8, 92, 95, 106, 123, 151, 169, 230, 236–8
  property of, *see* quality, conscious
  quality of, *see* quality, conscious
explanation, teleological 56–7
explanatory gap 8, 31, 108, 137, 180

fact 1, 23, 28, 37, 50, 165–6, 172, 179–83
  brute 16, 177, 179, 220
  counterfactual 126; *see also* truthmakers for counterfactuals
  modal 168

field 6–9, 25, 35, 37–9, 51, 59–60, 62, 68, 73–4, 81, 83–4, 117, 121, 131, 141–6, 155, 159–61, 165–6, 183, 195–6, 198, 200, 204, 210, 213–15, 219–20, 224
  consciousness 144–5
  gravitational 121–2, 138
first-person perspective 97
flat universe, *see* universe, flat
form 15–16, 19, 29, 150, 152–8, 161; *see also*, essence
  accidental 77, 153; *see also*, accident
  as active 152–3, 156–8
  individual 153, 155
  as a principle 61, 148, 152–3, 156, 158–9
  substantial 19, 29, 51, 56–7, 61, 77, 152–3, 155–9
foundedness 3–4, 22–9, 35–6, 92, 117–18, 157, 174, 177, 198–200
free choice; *see also* free will
  God's 174–5, 183
free will 16, 174–5, 217
functionalism 71–2, 100–3, 190

grounding 6, 22, 38, 47, 71, 73, 82, 87, 190–1, 207–9, 214

Humean mosaic 164–6, 192, 195
Humean supervenience, *see* supervenience, Humean
Humeanism *see*, metaphysics, Humean; universe, Humean

identity theory 106–7
identity, conditions of 19, 24, 26–7, 39–41, 44–6, 53–5, 70, 139–40, 204
  identity, strict 30–1, 199
image, manifest 4–10, 13–17, 37–9, 46, 53, 57–8, 60, 67, 71, 77–9, 82–4, 92, 130–1, 145–6, 178, 189–90, 196, 199–201, 207, 210–21, 227–8, 232–6; *see also*, image, scientific; reconciliation of manifest and scientific images
image, scientific 4–10, 13–14, 16–17, 37–9, 46, 60, 71, 146, 189–90, 196, 199–201, 210–21, 227–8, 232–6; *see also*, image, manifest; reconciliation of manifest and scientific images
individuation 19, 86, 166–7, 204
inventions, philosophers' 9, 28, 103; *see also* object, philosophers'

judgment, modal 16, 33–4, 66, 162–3, 165–70, 177–8, 186–7, 192
  truthmakers for 16, 112–13, 122, 126, 162–3, 166, 168–71, 174, 176, 192

kinds 14, 19, 48–9, 52, 61–8, 154, 206
  as essences 70–1, 75, 77, 156, 158, 220
  instances of 67–8, 70, 77

laws of nature 8–9, 12–13, 15, 55–7, 111, 113–17, 124–8
  as contingent 15, 34, 55, 79, 117, 126
  higher-level 133, 137–8
  as higher-order 114
  instances of 113, 116
  as principles 55, 57, 117, 124–6
  probabilistic 115–17
  see also causation, probabilistic
  as relations 113–15
  statements of 12–13, 39, 113, 115, 126
levels of reality, *see* universe, hierarchical
libertarianism 221, 227

manifest image, *see* image, manifest; *see also*, image, scientific; reconciliation of manifest and scientific images
matter 15–16, 19, 43, 59, 83–4, 95, 143, 150–2, 154–6, 158–61, 165–6, 204, 210, 231
  prime 154–5 ; as pure potentiality, 154
  proximate 154–5
meaning 32, 91
metametaphysics 2–3
metaphysics 1, 17–18, 38, 46, 82, 117, 191, 236–7, 239
  applied 94, 118, 217
  Aristotelian 12–16, 19, 29, 40, 56, 64, 124–7, 130, 134, 148–55, 158–63, 176, 178, 198, 200, 214
  Humean 12–14, 16, 32–4, 61–2, 164–8, 177–8, 186–90, 192–3, 196–7, 202, 210–11, 214–15, 219
  as inevitable 2–4, 7, 236–7
  and language 6, 81, 189, 191

metaphysics (*cont.*)
ontologically serious 12, 18, 20–3, 36, 38–9, 45, 117, 139, 149, 172, 189, 237
as a package deal 10–12, 149
of quantum physics 35–6, 116, 131, 134, 202–4, 207, 210–11
as the science of essence 61–2, 163
and truthmaking 12, 20–3, 26, 28, 34–5, 162–3, 176, 189–90, 212, 217–18, 221, 226–34, 236, 238
what is? 1–4, 10–13, 17–19, 37, 46, 49, 148–9, 163, 236–7, 239
mind 3–4, 15, 30–1, 93, 199–200, 225
-dependence 154, 213
-independence 118, 154, 164
see also, causation, mental; consciousness; experience, conscious, property, emergent; property, functional; property, mental; property, phenomenal; qualia; state, mental; substance, emergent; substance, mental
modal realism, *see* realism, modal
modality 16, 32–6, 66, 77, 80, 112–14, 162, 179, 186–7, 197, 201–2; *see also*, contingency; judgment, modal; necessity
dispositional 127–8
and essence 163
and possible worlds, *see* world, possible
mode 14–15, 19–20, 24–5, 28–31, 39–42, 46–7, 59–60, 62, 68–9, 77, 81–2, 86, 114, 119, 141–2, 153–4, 160–1, 195–6, 199–201, 204–5, 207–10, 213–16, 238
monism 73–5, 159–61, 198–202, 204, 207–10, 212–14, 219, 238
priority 207–10
see also, universe, blancmange
Moorean truth 208–10
motion, nature of 15–16, 55, 74, 81, 159–61, 196, 199, 203–5, 212, 229, 231–2, 234

necessitation 71, 73, 96–7, 112–15, 174–5, 177, 184
see also causation as necessitation
necessity 11, 16, 32–5, 66, 98, 123–4, 161, 163–5, 167–8, 171, 174–5, 185, 187, 192, 197, 201, 219–20
nothing 165, 176, 185–6, 207
nothing over and above 9, 20, 99, 136, 142, 205

object
as a disturbance in a field, *see* object, as modifications of a field
experienced 4, 17, 99–100, 104–5
gerrymandered 52
higher-level 6, 8–10, 71–3, 133, 137–8, 140, 190, 219–20, 224–5
ordinary 6, 14, 38–9, 42, 45–50, 57–60, 68–9, 75, 78, 85–6, 102, 130, 139–40, 143, 145, 150, 154, 199–200
as mode 23, 59–60, 68, 74–5, 83–4, 129, 141–2, 145, 158–61, 196–9, 204–5, 207, 209–10, 213–14, 219–20, 238
as modifications of a field 25, 35–6, 38–9, 51, 59, 68, 73–4, 81, 83–4, 129, 141–5, 159–61, 196–8, 204, 210, 213–15, 219–20, 226–8, 231
philosophers' 48–9, 70
objects, coinciding 49, 53–5, 66–7, 143–4, 196–8
object, complex 47–9, 69
identity conditions for 44–5, 53–5, 70, 140
persistence conditions for 44–5, 53–5, 139–40, 152
property of 15, 46–7, 57–9, 130, 134, 137–9, 207, 211; *see also*, emergence
Ockham's Razor 83; *see also* parsimony
ontic structural realism, *see* realism, ontic structural
ontological candor 4, 21
ontological seriousness 12, 18, 20, 36, 38, 45, 62, 117, 139, 149, 172, 181, 189, 237
ontology, analytic 17–20, 191; *see also*, category, ontological
ontology, relational 204–7
see also, realism, ontic structural
ontology, substance–property 36, 59, 83–4, 131, 175, 193, 195, 213–15

panpsychism 95, 108, 143–5
Campbell's 142–5
parsimony 36, 83, 120, 177; *see also*, Ockham's Razor

part 14–15, 42–8, 53–4, 58–9, 133, 136–42, 150, 154–8, 166–7, 207–11, 213–14
  part, mereological 43, 133
  nonsubstantial 42–3
  properties as 25
  spatial 42–3
  substantial 39, 42–8, 62, 74, 91, 130–3, 159, 208–9, 219
  temporal 42–3, 208
parthood 193
phenomenological fallacy 104
physicalism, nonreductive 71–3, 88–9, 91, 133–4, 190
possibility, logical 167–9, 178, 183–4, 192, 201
power 8, 12–15, 33, 55–8, 78, 99–103, 108–9, 111, 120–30, 136, 138–41, 144, 147–9, 156, 169, 174–8, 183, 185, 187, 189–90, 192, 197–8, 205, 211, 222, 225; *see also* disposition
  active and passive 84–5, 121
  emergent 138
  forward- and backward-looking 84–5
  as higher-level 87–91
  as higher-order 87–91
  identity conditions for 14–15, 84–5, 123, 127
  individuation of 86
  as mark of the real 82
  as a quiddity 84, 100
  as a relation 84–5
  unifying 152–3, 156–8
Principle of Sufficient Reason 187–8
privation 128–9; *see also*, absence
profile
  causal–dispositional 72, 100–1, 103
  manifestation 122
  modal 66–7, 76
property 10, 78
  alien 33–4, 170, 183–4
  by courtesy 20, 58, 130–1; *see also*, property, quasi-
  categorical 86–90, 92, 102
  as correlative with substance 25, 36, 41, 81–3, 130, 175, 195
  dispositional 57, 86, 88–90, 92, 102, 126–7
  emergent 15, 58–9, 131–3
  as empowering 57, 79, 82–3, 85, 89–92, 120–2, 149; *see also*, quality, as empowering
  Episcopalian 58, 130–1, 136–7
  family 21, 73, 88
  higher-level 7, 73, 87–91, 133, 140, 190–1
  higher-order 59–60, 72, 87–91, 190–1
  historical 53–4
  identity conditions for 122–3, 153, 176
  instance 19–20, 24, 28–9
  Janus-faced 101
  mental 22, 88–9, 94, 96–9, 102, 104, 108, 133, 238
  modal 53–4
  phenomenal 3, 94, 97, 99, 104, 108
  physical 88, 96–9, 102, 104, 108, 133, 238
  quasi- 58, 130–1, 139; *see also* property by courtesy
  relational 119
  resultant 136
  second-order 88–9, 196
  shared 28, 42, 72
  structural 135–6, 181
  as a way 14, 24–5, 28–31, 33, 36, 39–42, 46–7, 54–5, 57–60, 62, 77, 80–4, 114, 120, 130, 153, 159, 161, 175, 195–6

qualia 94, 97, 104, 166–7; *see also*, property, phenomenal
quality 14–15, 37, 64–5, 78–80, 93, 124, 130, 151, 156, 164–6, 175, 178, 191–8, 201, 204–7, 209–11, 215–16, 236
  of bodily sensations 105–8
  of a complex whole 15, 47, 58–9, 130–4, 137–41, 148–9, 157–8, 202
  conscious 15, 94–5, 97, 99–111, 142–3
  as empowering 12–15, 33, 80, 82, 86, 91–2, 99–103, 106, 120–4, 126–7, 142–3, 172–7; *see also*, property, as empowering
  experiential, *see* quality, conscious
  phenomenal 3, 94, 97, 99, 104, 108; *see also*, quality, conscious
  powerful 79–80, 86, 102
  primary and secondary 98–100, 104
  as a pure quiddity 100
quantum physics 35, 80, 116, 131, 134, 202–7, 210–11, 215

realism; *see also*, truthmaking
  Aristotelian modal 174–7
  modal 167–71
  ontic structural 35, 204–7
  painless 69, 170, 194, 201–2
  painless modal 170, 201–2
realization 6, 14–15, 38, 71–3, 87, 89–91, 94, 98, 133, 190–1, 224–5
realization, multiple 71–2, 89–90
reconciliation of manifest and scientific images 16–17, 38–9, 160, 203
relation 14–15, 18–24, 28–9, 35, 37, 39, 47, 62–3, 69, 73, 83–5, 92, 166–7, 172, 238
  asymmetric 73, 86–7, 96–7, 112, 194
  causal, *see* causation
  constitution 30, 48–9, 51, 69–70, 139–40, 142, 206
  dissimilarity 119; *see also* relation, similarity
  exemplification 24, 40, 164
  external 28, 112, 117–20, 165–6, 187
  founded 20–9, 32, 35–6, 92, 117–18, 157, 198–200
  identity 119, 199
  instantiation 24, 41–2, 165–6
  internal 15, 26–7, 85, 117–20, 123, 127, 176
  nontransitive 51, 170
  similarity 26–7, 51, 119, 169–70, 177; *see also* relation, dissimilarity
  spatial 25–8, 42–3, 112, 117–18, 204, 206
  symmetric 87, 121, 126–7, 175–6
  temporal 25–8, 112, 117–18
  transitive 112
relativity 35, 62, 131, 141, 199, 211, 215
respects 28, 51, 53–4, 58, 105, 113, 126, 169, 173

scientific image, *see* image, scientific; reconciliation of manifest and scientific images
  incompatibilism 224, 227, 231
sensation, bodily 105–8
similarity, *see* relation, similarity
slippage 14, 70–2, 75, 90, 107, 191, 227
special composition question 48–9, 150, 156; *see also* composition
space 25–7, 31, 38, 42–3, 54, 59–60, 62–3, 68, 73–4, 83–4, 125–6, 141–2, 159–61, 175, 183, 185, 194–5, 199, 204, 208, 219, 231
  attribute 169
  configuration 83–4
  container 59, 62, 204
  location in 25–8, 161, 166–7, 196, 204–6, 212
  logical 164–5, 169
  place in 27, 160
  region of 30, 142, 144
  similarity 169–70
  as substantival, *see* substance, space and spacetime as
spacetime 27, 32, 35, 37–8, 47, 59–60, 62–3, 68, 73–4, 83–4, 100, 141, 144, 159–61, 165–6, 183, 194–8, 200, 204, 209–10, 212, 215, 219, 228–9, 231,
  disturbance in 59, 68, 141, 196–8, 229, 231
  location in 25, 62
  modification of 35, 129, 159–61, 195–6, 210, 212, 215, 219, 228
  points of 165–6
  quality of 166, 193–5, 209
  region of 68, 159, 161
  as substantival, *see* substance, space and spacetime as
spontaneity 123–4, 172–7, 184–6, 222–4, 227–31, 234
state 21, 90, 95; *see also*, fact
  of affairs 23–5, 28–9, 31–2, 41–2, 90, 181, 187
  bodily 105–9
  conscious 30, 88, 97, 99, 102–10, 123–4, 143–4, 180, 225
  dispositional 89–90, 92, 100–3, 116; *see also*, dispositional system; dispositional matrix
  emergent 135–6
  functional 100–3
  mental 72–3, 88–9, 93, 95, 98–100, 102–3, 105–10, 225, 238
  higher-level 72–3, 114, 133, 225
  higher-order 72, 114
  material; *see* state, physical
  nonconscious 95, 105
  physical 88–9, 98, 107–9, 144, 180, 238

quantum 203–4
of the universe 33–4, 48, 50, 75–6, 172, 175–7, 184–6, 210
subjectivity 82, 109–10, 133; *see also*, first-person perspective
subject–predicate 83
substance 10, 14, 19–20, 23–5, 29–31, 35–6, 54, 59–60, 62–3, 68–9, 73–5, 77, 79–80, 130, 152–5, 157, 198–200, 204
as bearer of properties 14, 41, 46–7, 54, 57–8, 62, 81–3, 91, 130–2, 139
as correlative with property 25, 36, 41, 81–3, 130, 175, 195
emergent 15, 132, 134–5, 157
Locke on 64–5, 156
material, *see* substance, physical
mental 31, 72–3, 96–7, 199
numerosity of 131, 146, 190
physical 96–8, 199
as powerful 13, 80, 82–4, 91, 102, 122, 138, 178, 183
priority of 41–2, 132, 207–10, 213
as simple 42–6, 54, 57–8, 62, 91, 130
space and spacetime as 27, 30–1, 35, 42–3, 59–60, 62–3, 83–4, 129, 131, 141–2, 158–61, 175, 183, 194–201, 209–10, 212, 215, 219, 228–9, 231
supervenience 21–2, 73, 98, 191
Aristotelian 176
Humean 84, 165–8, 210–11

taxonomy 67, 71, 75–7, 90, 106–7, 140, 148, 154, 214–15
everyday and scientific 51, 67, 71, 75–6, 90, 214–15; *see also*, manifest image; scientific image
higher-level 71
thinking comprehendingly 64–6, 77
third-person perspective 97; *see also*, view from nowhere
trope 19, 24–5, 40–1, 143, 166, 191–6
bundle of 24–5, 40–1, 194, 209
transubstantiation 40
truthmakers 28, 34, 81
for causal judgments 25–8, 120, 122, 189–90, 213
for counterfactuals 20–1, 32–3, 113, 121–2, 126, 169–70, 174, 192–3
for general truths 82
for law statements 55, 149
for modal truths 16, 112–13, 162–3, 168, 170–1, 174
for relational truths 20–3, 62, 85, 118, 190
for spatio-temporal truths 25–8, 117–18
for truths about absences 129
for truths about agency 221, 226–31, 234
for truths about change 197
for truths about complex objects 47, 52, 108–9, 139–40, 148–9
for truths about inhibitors 129
for truths about motion 81, 161
for truths about preventers 129
for truths about privations 129
for truths about universals 82
for truths in the manifest image 16, 212, 215–18, 227–31, 236, 238
nature of 16, 35
truthmaking 12, 20–3, 166, 176, 189–90, 192, 209–10, 236
and foundedness, *see* foundedness
two tables 5–6, 10, 38

universals 14–15, 24, 28–9, 33, 39–42, 61–2, 67–70, 77, 82, 114–15, 118–19, 149, 153–6, 166, 193–4, 201–2
identified with essences 14, 29, 68–70, 76–7, 153
instances of 41–2, 68–70, 77, 114, 153–4, 166, 194
as general entities 68–70, 82, 114, 153
nonsubstantial 19–20
Platonic 14–15, 41–2, 114
substantial 19–20, 77
transcendent 14–15, 33
universe 3–6, 10, 15, 20–1, 34–5, 37, 75–6, 78, 81, 171–4, 220, 229–30, 232–3, 236, 238
alternative 11, 20–1, 32–4, 113–14, 123–6, 162–5, 167–72, 177, 183–4, 186–7, 192; *see also*, world, possible
Aristotelian 12–14, 33, 82–4, 124–8, 174–8, 214
blancmange 159–61
Cartesian 30–1, 198–9, 213
corpuscular 39, 42, 49–53, 59, 62–3, 68–9, 73–5, 78, 141, 149, 190, 204, 219

universe (*cont.*)
deterministic 16, 124, 223–4, 230, 232
flat 192, 213
frozen 196–7
hierarchical 7–9, 71–3, 190–1, 214, 224–6
Humean 12–14, 32–3, 162, 166, 186–8, 192–6
multi- 167, 181, 210–11
non-Aristotelian 124–6; *see also*, universe, Humean
physical 94–8, 100–2
pluralistic 49, 60, 131, 146, 200, 215–16, 219
power-imbued 120–3, 183–4; *see also*, Aristotelian
relational 84, 205–7; *see also*, ontology, relational
seamless 51, 59–60, 73–5, 83, 131, 141–6; *see also*, universe, blancmange
Spinoza 198–201, 207–14
Spinoza–Williams–Lewis 202–4, 207, 210, 213–14, 219, 232
of stuffs 15–16, 83–4, 149, 154–5, 158–61, 200, 214; *see also*, universe, blancmange
Williams–Lewis 193, 196–8, 201–2, 209–10, 213
vs world 11, 162

vacuum 146–7, 172, 174–5, 184–5
vagueness 1, 49–53, 63, 148
view from nowhere 97; *see also* third-person perspective
void 185

way the universe is 12, 23, 76–7, 81, 85, 146, 160–1, 166, 171, 174, 177, 180–3, 186–7, 199–201, 213–14
world
external 6, 104
possible 11, 19, 113, 162, 164–5, 168–71, 191–2; *see also*, universe, alternative
Why there is something (rather than nothing) 165, 186

Zombie, philosophical 103